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THE REPAIR OF ESSENTIAL BUILDINGS

WHAT is clearly an important step in war-time building organisation has been signalised by the appointment of Major-General K. C. Appleyard, C.B.E., to the new post of Director of Emergency Reconstruction in the Ministry of Works and Buildings.

Though this appointment was announced only on Monday, the Director took an early opportunity of explaining the scope of his department's work. This will be to concentrate, with the Emergency Organisation of the Ministry of Aircraft Production under Sir Peter Bennett, on the repair of vital buildings and services with the greatest possible speed, so that war production may suffer as little as possible. This important work will thus, for the first time, come under the direct control of the Ministry of Works and Buildings.

It appears that the new organisation, though primarily intended for war factory repair, will be available for any urgent repair of a similar nature. "It will," said the Director, "be responsible in the first place for the repair of buildings of interest to the Admiralty, the Ministry of Supply and the Ministry of Aircraft Production, and will be organised on a national basis.

"The department will work in close co-operation with Sir Peter Bennett's emergency organisation, and will take charge of the building side of things, though the responsibility for decisions on priority of repair, in so far as aircraft buildings are concerned, will rest with Sir Peter's department. Our aim is to make preparations to be able to tackle any job of urgent repair at a moment's notice, and to do this, we intend to plan before rather than after raids.

"Our national organisation will have offices wherever it is decided necessary, each under the control of a local officer. It will be the duty of each officer to undertake a survey of local resources in technical skill, labour and materials. As regards the latter, many stores are already in existence in various towns; if required, these will be built up so that ample supplies of building materials will be available immediately. The labour pool will be surveyed in each 'target' area and preparations will be made to supplement it if insufficient, in collaboration with the Ministry of Labour and National Service, and in close co-operation with the Operatives' Federation. In cases of extreme necessity the Army might be called upon to help."

The new department, added General Appleyard, would be prepared to help local authorities in the repair of houses and essential services irrespective of their connection with factories. It would also help, if found desirable, with restoration work on factories other than those connected with the war effort, but this class of work would obviously have a low priority.

The Director explained that the local area officers would be appointed from the ranks of architects, surveyors, civil engineers or building contractors—wherever they could find the right man. That officer would, as already explained, marshal the technical skill in the area, for it was intended to use the local resources, both as regards architects and contractors, to the full.

It is amply clear from the Director's statement that the essentials of this new step are the extension of the scheme of Local Reconstruction Panels which have for some time been in operation for the repair of aircraft factories to take in all buildings required by the war effort, including, if necessary, housing and essential services normally under the control of the local authorities; and, further, to place all these panels under control administered locally but centralised in the Ministry of Works and Buildings.

In effect, this means the appointment of local building controllers who, being acquainted with local resources of technical assistance, labour and materials, will be responsible for the execution of building works on damaged buildings in an order of priority which Sir Peter Bennett's Emergency Organisation will decide in so far as aircraft production is concerned.

This development seems to be a natural one which should prevent overlapping of effort in the reconstruction field. It should be especially valuable in securing the necessary fluidity of labour in so-called "target" areas where, generally speaking, the demand for skilled men is in excess of the supply. It is not intended, it seems, to set up controllers in every town or area; that will be decided after taking a number of factors into consideration. But where these controllers are appointed, the local responsibility for the supply of materials and labour at present vested in the local authority will devolve upon the new controllers, who, it may be safely assumed, will work in close co-operation with the local authorities.

Quite clearly the success of this scheme will largely depend upon the tact and efficiency of the local controllers, for the essence of its workability is to weld local resources into a cohesive organisation ready for immediate action. Such a scheme, though organised on a national basis, must essentially be decentralised as regards action, and too much use cannot be made, we believe, of the services of local architects and technicians who have been used to working on the closest terms with local builders and operatives.

Thus far we commend the steps which have been taken and, in wishing the new Director well in his task, await with interest the operation of this far-reaching scheme.

VIEW OF THE FORUM. BY HUBERT ROBERT.

This painting (oil on canvas) by Hubert Robert (1733-1808) is an early example of this French artist's work, and shows classical ruins with archaeological exactness in their actual setting. The painting (lent by Mr. F. A. Drey) forms part of an Exhibition of Architectural and Decorative Drawings on view at the Courtauld Institute until February 28. This Exhibition is noticed on the page facing.

NOTES AND NEWS

Emergency Reconstruction: Director Appointed.

Lord Reith, Minister of Works and Buildings, has appointed Major-General K. C. Appleyard, C.B.E., to the post of Director of Emergency Reconstruction, within the Building Priority Department. The objective of the Director of Emergency Reconstruction, co-ordinating with the emergency services organisation of the Ministry of Aircraft Production, will be to concentrate on the repair of vital factories and buildings with the greatest possible speed, so that the war production may suffer as little as possible.

General Appleyard's task is referred to in our leading article.

Rehousing of Bombed Homeless.

Mr. George Hicks, Parliamentary Secretary to the Ministry of Works and Buildings, attended a meeting on February 8, at which representatives of Bristol, Portsmouth, and other bombed areas considered how best their homeless citizens could be rehoused. It is understood that the formation of a national committee to deal with the whole subject was suggested, and that the question was raised of doing at once more extensive repairs to damaged houses.

Mr. Hicks had stated some days earlier, in the House of Commons, that the Government's view is that no permanent rebuilding or repairing of bombed premises should be undertaken at present unless it is in any particular case clearly in the national interest.

Commission on City Church Salvage.

The Bishop of London (Dr. Fisher) writes in the *London Diocesan Leaflet*:—"The City and the glorious City churches have suffered severely, and danger still threatens those which have been spared. I have set up a special committee, with Prebendary Wellard as secretary, to secure that everything possible is done to save what can be saved of the architectural and historical treasures in the City churches. That is 'first-aid' work. There remain ultimate questions of the greatest importance concerning these churches which have long been on the horizon and now demand full consideration. In particular, decisions must be made about the rebuilding or reproduction of the churches which have been almost totally destroyed, and such decisions cannot be made without reference to plans that may be made for reconstruction of parts of the City area. I propose shortly to set up a commission upon the City churches which may advise upon all these matters. It will include, I hope, representatives of the City itself, which is so intimately concerned, as well as of the Church and of some special interests."

Natural History Museum Bombed.

It is now stated that a number of high-explosive and incendiary bombs have fallen on the British Museum (Natural History), and serious fires have occurred in the General Herbarium and the Shell Gallery. Considerable damage was done to the botanical collections, but it will be impossible for some time to know its precise extent.

Blickling Hall for the National Trust.

The late Lord Lothian has bequeathed his Blickling estate in Norfolk and practically all the contents of Blickling Hall to the National Trust. The Trust is at present considering the question of its acceptance. Blickling Hall was erected early in the seventeenth century, and stands in an estate of some 6,000 acres.

R.A. Summer Exhibition: Days for Receiving Works.

Days for receiving works for the Royal Academy Summer Exhibition, 1941, are as follows: Water-colours, pastels, miniatures, black-and-white drawings, colour prints, engravings, and architectural drawings, Friday, March 28; oil paintings, Saturday and Monday, March 29 and 31; sculpture, Tuesday, April 1. The hours for the reception of works are 8 a.m. to 7 p.m., except Saturday, March 29, when they are 8 a.m. to 3 p.m. Not more than three works may be sent by any one artist. Labels and forms can be obtained during the month of March only, from Burlington House, Piccadilly, W. The Exhibition opens on Monday, May 5, and closes on Saturday, August 9.

Bungalow Rehousing Scheme, Liverpool.

The Liverpool City Architect has been asked by the Civil Defence Emergency Committee to prepare a scheme for communal dining centres on four suburban estates. Small kitchens are to be set up throughout the inner portion of the city.

The Committee has failed to secure the approval of the Minister of Health to a proposal to erect a thousand bungalows on sites near existing housing estates. They have been designed for standardised construction similar to that used in the emergency hospitals, in which the use of timber was almost entirely eliminated.

The Housing Committee has been recommended, however, to proceed with ten bungalows as an experiment; the cost would be met by an anonymous donor. Such dwellings, the life of which would be 25 to 28 years, would be invaluable in the first instance for the immediate rehousing of persons bombed from their homes, and in the second place for use as clearing stations during rebuilding and redevelopment.

An Exhibition of Architectural Drawings.

An Exhibition of architectural and decorative drawings is now on view at the Courtauld Institute. Courage and enthusiasm are necessary to organise an exhibition of this character during such troubled times, but it has been done and done thoroughly. It is to be hoped that it will be well patronised; no doubt the enthusiast and lover of fine drawings will, come what may, find time to pay it a visit.

With few exceptions the drawings exhibited were made long before the day of the professional draughtsman; therefore one gets the individual work of the designer or artist, and the draughtsmanship does not overpower the character of the design, but expresses it in simple delineation; and this is where the interest is so strong.

The drawings range from the sixteenth century to the early nineteenth century. No doubt a number of the decorative designs would be considered florid according to present-day conceptions—perhaps rightly in this age of concrete and steel. Nevertheless, they have a fascinating interest to the student, young or old. Such artists as Hubert Robert (1733-1808), David Roberts (1769-1864), Giovanni Battista Bertani (1516-1576), Nicolas Poussin (1594-1665), and Bartolommeo Granucci (early eighteenth century), are well known by their paintings.

Among the English drawings is a water-colour attributed to George Repton, after John Nash—of a house built for Lord Lorton, in 1810, at Roscommon. Sir John Vanbrugh (1664-1726) is represented by a sketch for a gateway at Blenheim; Sir John Soane by a design for a belvedere, to mention but a few of many artists' work to be seen.

It is hoped that the present Exhibition may show that architectural drawings are often of great beauty, and that, properly interpreted, they provide important information about the history of buildings which cannot be obtained from any other source. A tribute should be paid to the compiler of the catalogue, which is well worth preserving for the information it gives.

The Exhibition is open until February 28 at 20, Portman-square, W., from 10 to 5, Saturdays 10 to 1.

IN 1916.

From *The Builder*, February 11.

Much satisfaction has been caused in Belgian circles in Holland by the German statement that the Germans do not intend, as was at one time reported, to undertake the rebuilding of Louvain. The *Echo Belge* remarks that it is bad enough that the Germans should have destroyed Louvain, but for them to rebuild it in the German style would be even worse.

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1939 BASIC PRICES IN COMPENSATION CLAIMS

In response to a considerable demand the representative prices for materials and measured work at March 31, 1939, given in the New Year issue of "The Builder," have been reprinted on stout card in the form of a triple folder. Conveniently arranged for reference, the prices give in compact form the essential information needed by those charged with the responsibility of estimating the cost of war damage under the Insurance Bill. Copies of the folder may be obtained, price 1s. each, post free, from The Builder, Ltd., 4, Catherine Street, Aldwych, London, W.C.2.

CORRESPONDENCE

[While we are glad to publish letters on professional and other matters of interest to our readers, it must be understood that we do not necessarily endorse the remarks of correspondents, who will oblige us if they will express their views as briefly as possible.]

The Liverpool School of Architecture.

To the Editor of *The Builder*.

Sir,—Some time ago it was stated in the course of an article in the *News Chronicle* that the Liverpool School of Architecture had closed. When my attention was drawn to this statement I immediately wrote to the editor of that paper, who promptly published a correction of it. Unfortunately, the original statement seems to have obtained wider currency than the correction. As a result I am still receiving inquiries as to why the School is closed and when it may be expected to open again.

I shall be greatly obliged, therefore, if you will be kind enough to give me this opportunity of saying once again that the School is not closed and that there is no intention that it shall be closed.

Whilst we no longer have our normal complement of 220 students, we still have over 100 students taking the full five-year course, leading either to the Degree or the Diploma in Architecture. The School's Department of Civic Design also continues to function, and includes amongst its students fifteen who are taking either the Degree or the Diploma Course in Architecture.

Lionel B. Budden.

Liverpool

Build or Restore?

To the Editor of *The Builder*.

Sir,—There has been a considerable amount of correspondence in the national papers and the professional journals on the question of rebuilding or restoring the damaged City churches and other buildings of outstanding architectural merit. Certainly the problem will be one of the most interesting that the architectural world and all who are interested in the fate of their cities will have to face in the new peace.

The controversy has already drawn out men of the highest distinction in the architectural and artistic professions. The Presidents of the Royal Academy and of the Royal Institute of British Architects have taken part, and there has been no lack of expression from the most prominent architects. We have also heard a wireless broadcast from a past-President of the Royal Institute.

One might suppose that such an array of culture and authority would go far towards simplifying the problem for the interested, but uninitiated, laymen in architectural matters. One might have expected that some lead would thus be given to those who are directly concerned with building but have hitherto had to remain unenlightened in the subject of architectural æsthetics. Yet this is not the case, and the question remains increasingly difficult for laymen to follow. They have certainly not been encouraged to form even a tentative opinion of their own.

The professional views expressed have varied between suggestions for complete rebuilding from preserved original drawings, together with recent measured drawings and photographs, either on the present sites, or, as suggested by one eminent architect, in the case of the Wren churches, distributed over the counties, to the completion of the demolition and the rebuilding of the structure in the style of this generation. We have been assured, on the one hand, that the architectural merit can be recaptured in the rebuilding, and, on the other hand, from authority of equal eminence, that such a task is impossible. Not only this, but the Wren churches themselves have been referred to by leading members of the profession as masterpieces that would enrich any town fortunate enough to possess them, and, alternatively, as a lot of churches rushed up by Wren after the Fire to meet the immediate requirements. And, lastly, one authority at least has told us that the churches were not designed for the usages of modern church life and that there is not a single church that has not had to be pulled about to the point of distortion in order to adapt it to present requirements.

This leaves the layman still wondering whether to throw in his lot with those who would have all the existing intact stones numbered and reused in a future rebuilding, or whether to shed a tear for what we have lost and to set to with a good heart to build a new city after clearing away the ruins of the old.

But perhaps the problem is not so complex as the miscellany of letters to the Press has made it appear. For these letters had to be short enough to be merely expressions of a viewpoint, and not explanations. On analysis it would appear that there are two questions, both of which are in dispute, to be answered. The first is, "Can the rebuilding be carried out in such a way as to regain the original architectural quality?" and, arising from the fact that in some buildings at least the repetition of the old design would not give a satisfactory solution to the planning and utilitarian functions of the building, the second question becomes, "Should the rebuilding be carried out for the sake of the æsthetic distinction a design may have held?"

In the case of the first question, it is clear that no decision can be hastily arrived at, if only out of respect for the weight of authority on both sides. It seems to be apparent that the experts disagree because of a difference in opinion as to wherein lies the architectural merit which they would both like to restore if possible. Those who feel that measured drawings, and even original drawings, are not sufficient to capture the character of a design evidently expect to find that character, or a good portion of it, in the personal idiosyncrasies of the craftsmen, and they are of opinion that the craftsmen of to-day are not possessed of the same kind of spirit as those of, say, Wren's time; and, what is more to the point, that there are not enough of them nowadays, for the need of this kind of craftsmanship has been dead for many a long year.

On the other hand, those of equal eminence who have advocated rebuilding, in some cases, even on different sites, must hold that the bulk of the æsthetic content lies in the massing, proportion and form, all of which are easily measurable qualities, and, being measurable, are capable of being repeated. The craftsmanship in the way of stone and wood cutting is apparently subservient. And perhaps this school of thought is of opinion that there are sufficient craftsmen of the right kind to undertake the work.

A thought which has not been mentioned by the authorities but which might be permitted to the laymen is that, whereas an elaborately enriched Decorated or Perpendicular building might be so dependent on its content of craftsmanship as to be well-nigh unrepeatable from measured drawings, the comparatively unadorned solid proportions of, say, a Wren exterior might be successfully repeated by a capable and sympathetic architect.

So far as the question "Whether we should rebuild even if it is possible to do so successfully" is concerned, we must bear in mind that it is the æsthetic, not the utilitarian, value that we wish to retain, and it would seem, therefore, that each instance would have to be considered individually. It may be that any failure of a Wren church to meet the utilitarian requirements of modern church procedure is compensated by the Wren æsthetics, but the same could not be said to hold good for, say, a factory or office building, in which the utilitarian demands are of a complex nature and much more insistent.

There is probably little doubt that a new building would meet the planning and functional requirements of modern times infinitely better than even the most successful eighteenth-century façade, so that we must be assured that a design possesses æsthetic merit of an exceptionally high order, which is fully capable of being regained, before we commit ourselves to rebuilding to the original plans.

Eric D. Hill, L.R.I.B.A.

Arbroath, Scotland.

*** The above letter was received after the publication of our last issue, which contained a leading article on the same subject expressing somewhat similar views.—Ed.

COMPETITION NEWS

Cathedral for the Diocese of Auckland, New Zealand.

Sir Giles Gilbert Scott, R.A., P.-P. R.I.B.A., the assessor, has now made his award in the competition for a Cathedral for the Diocese of Auckland, and his report has been sent to the promoters in New Zealand. His award places the following competitors in the four premiated positions:—

1st (premium £1,000).—Design No. 22: Mr. Charles Towle, A.R.I.B.A., A.N.Z.I.A., 901-2, Barrack House, 16, Barrack-street, Sydney, N.S.W.

2nd (£400).—Design No. 23: Mr. Amyas D. Connell, A.R.I.B.A., A.N.Z.I.A., Well House, Well, near Long Sutton, Hants, England.

3rd (£200).—Design No. 14: Messrs. Fergus G. F. Sheppard, A.N.Z.I.A., 35, Challenger-street, St. Helier's Bay, Auckland, E.1, and J. R. P. Blake-Kelly, B.Arch., A.R.I.B.A., A.N.Z.I.A., P.O. Box 829, Auckland, New Zealand.

4th (£100).—Design No. 7: Messrs. T. K. Donner, A.R.I.B.A., A.N.Z.I.A., and H. Bartlett, B.Arch., A.R.I.B.A., A.N.Z.I.A., Bank of N.Z. Chambers, Swanson-street, Auckland, C.1, New Zealand.

The four premiated designs are now on exhibition at the New Zealand Government Offices, 415, Strand, London, W.C.2.

The first and second premiated designs are illustrated on pages 176-7.

COMING EVENTS

Tuesday, February 18.—Institution of Civil Engineers. Joint meeting with British Section of the Société des Ingénieurs Civils de France. Mr. Tony Jules Gueritte on "Further data concerning Pre-stressed Concrete: Comparison between Calculated Stresses Registered during Tests." 1.30 p.m.

Tuesday, February 18.—Architectural Association. Mr. T. F. Reddaway on "The Rebuilding of London after the Great Fire." 2.15 p.m.

WAR-TIME BUILDING PRACTICE

By R. Cotterell Butler, A.R.I.B.A.

43.—SHELTER PROTECTION.

"THE DISPERSAL THEORY"—*continued.*

DISPERSAL IN THEORY AND PRACTICE.

IN last week's *Builder*, the general theoretical principles of dispersal were discussed, and out of the many factors involved it was found possible to draw the following two important conclusions:—

1. Dispersal must be effective, and whether or not any scheme is effective will depend not only on the structural protection afforded by a shelter but on the distance between adjacent shelters AND THE CALIBRE OF THE BOMBS.

2. WHERE RANDOM BOMBING IS UNDER CONSIDERATION, the success of dispersal is governed by the bomb intensity over the area, in relation to the extent of dispersal adopted.

BOMB DISTRIBUTION IN PRACTICE.

Before deciding on the estimated effectiveness of a dispersal scheme, it is necessary to decide how evenly distributed the bomb intensity over an area is likely to be.

The conditions discussed in case *h* assume random bombing, but this does not necessarily conform to conditions in practice. Where aimed bombing is being considered, it has already been pointed out that dispersal has definite advantages by reducing the target presented and the maximum number of persons who may be killed by a given bomb. We have also seen that where the number of bombs is limited (case 1, Diagram 7, W-T.B.P.42), dispersal has definite advantages.

The importance of appreciating the "bomb limit factor" will be seen when certain types of bombing are considered.

Examine Diagrams 1a and 1b.—Both represent the same town subjected to what may be considered random bombing from a large number of bombs greatly exceeding the number of shelters in the dispersal scheme (*a*). According to the case *h*, the chances of casualties in that town are not altered by the grouping or dispersal of the shelters. But in practice, while many bombs may drop, they are more likely to be grouped than spread evenly, since they are frequently dropped in "sticks." This is particularly the case where during a night raid, an early 'plane drops a stick of fire bombs, and subsequent 'planes empty their bombs into or near to the conflagration. Under these circumstances, groups of bombs may be considered to behave similarly to single bombs, and the total "bombs" reduced, thus showing the advantages of dispersal which occur when the number of bombs is actually limited.

Thus in Diagrams 2*a* and 2*b*, the "hot spot" cannot cause as many casualties with a dispersed scheme as with a focal one. It is true that the concentration might be far away from the focal shelter, but just as easily it might be right on the shelter. Therefore, where it is reasonable to consider a group of bombs resulting from a raid as one bomb, the maximum number of persons who may be killed is reduced as long as the number of group raids does not exceed the number of shelter units, etc.

Furthermore, the types of risk run under these circumstances differ, since it is practically certain in case 2*a* that some casualties will occur, and it is quite certain that these will not be as many as *could* occur in 2*b*, while in 2*b* there might well be no casualties at all, but equally total casualties could occur. Thus under these conditions it becomes a case of either *some casualties definitely, but definitely not all, or probably none, but possibly all.*

It is not reasonable to say that these conditions balance one another in practice since from practical and politic points of view they are extremely dissimilar. These considerations are summarised in diagrammatic form below (Diagram 3).

Before condemning or advocating a scheme of dispersal for practical adoption, it is necessary to decide how effective the actual dispersal arrangement may be made from the point of view of the population density of the area in addition to the above factors.

From Diagrams 4*a* and 4*b*, it will be seen that what may appear a reasonably even bomb intensity with one standard of dispersal would appear far less like random bombing were the distribution of the population increased.

Other practical considerations besides bomb intensity and distribution are closely linked with the question of dispersal as a method for reducing casualties among a population. These may be summarised as follows:—

The effect of dispersal on structural protection afforded; the practicability of dispersal in connection with population density; the effect of dispersal on the prevention of the spread of infectious diseases; the effect of dispersal on the maintenance of moral; and relevant economic factors introduced in comparing dispersed and focused shelter schemes.

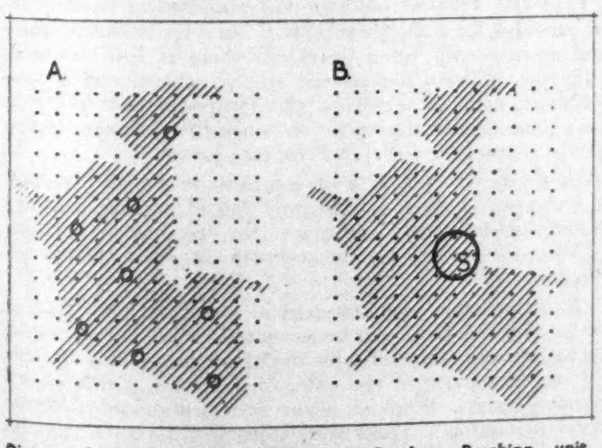


Diagram 1—BOMB DISTRIBUTION. A—Random Bombing, unit shelters. B—Random Bombing, group shelter.

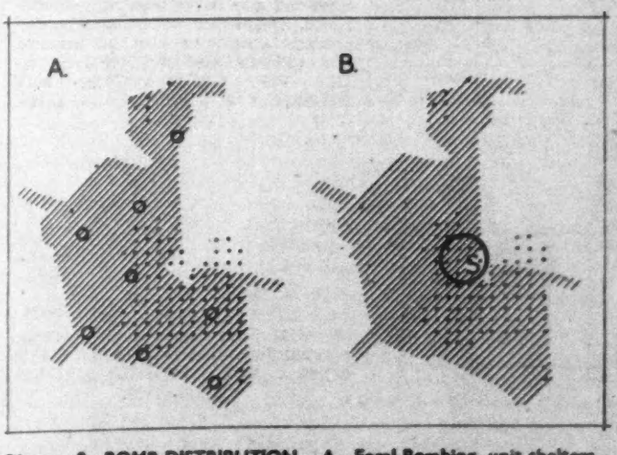
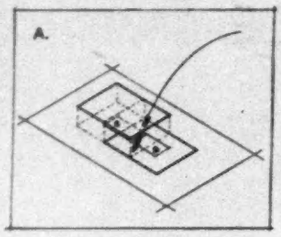
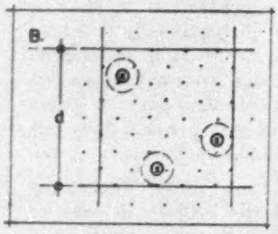


Diagram 2—BOMB DISTRIBUTION. A—Focal Bombing, unit shelters. B—Focal Bombing, group shelter.



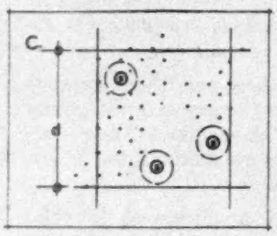
3a

(*a*) Grouping shelters results in a reduction of total danger area, but also results in the production of areas having high danger coefficients (danger areas intersect).



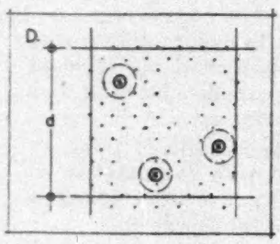
3b

(*b*) The difference between large areas having low danger coefficients and smaller areas having higher danger coefficients has little effect on possibilities of casualties WHERE RANDOM BOMBING OF HIGH INTENSITY IS ASSUMED.



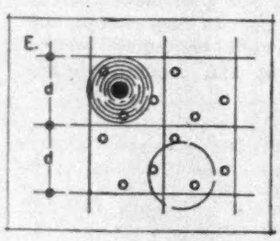
3c

(*c*) BUT, in practice, bomb intensities are frequently unevenly distributed over an area—even after extensive raids.



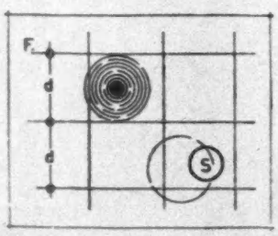
3d

(*d*) Under practical conditions, random bombing may be reasonably assumed only when the number of concentrations arising from intense raids begins to result in an even distribution of high intensity.



3e

(*e*) This stage is improbable in many areas and may never develop. THEREFORE, the effect of dispersal under practical conditions may be assumed often to be PROBABLY SOME CASUALTIES PER GIVEN BOMB, BUT DEFINITELY NOT TOTAL CASUALTIES.



3f

(*f*) With the population grouped POSSIBLY NO CASUALTIES PER GIVEN BOMB, BUT POSSIBLY TOTAL CASUALTIES.

Diagram 3—SUMMARY OF EFFECT OF DISTRIBUTION OF BOMB INTENSITIES ON EFFICACY OF DISPERSAL.

STRUCTURAL PROTECTION.

Dispersal results in differing sizes of shelter, and the size of a shelter alone has an effect upon the safety of any specific individual. This ensues from the different behaviour of a bomb if exploding in an open or a confined space.

From Diagram 5A it may be seen that any specific person stands a greater chance of safety from any given bomb if he is in a small shelter rather than a large one (assuming the structural resistance of the walls of the shelters is the same in both cases), because a bomb falling within the group shelter is confined and would be likely to cause more damage than if it fell the *same distance away* and he was in a unit shelter, Diagram 5B.

Reference to case "a" shows that the practical considerations introduced by a bomb falling in the open or in a confined space do modify somewhat the inferences which may be drawn from theoretical reasoning, although the chance of a bomb hitting any given individual is not affected by whether he is in a group shelter or not. This factor is considerably modified in practice by the structural protection afforded to a person by the bodies of surrounding persons. This may be considerable in a large shelter. Furthermore, most mass shelters would be expected to have cross walls, and where these approach outer walls in structural resistance, the situation is again altered.

DISPERSAL: POPULATION DENSITY.

The practicability of sufficiently dispersing any given population for the dispersal to have effective results, will depend on the amount of area over which the population may be spread without disorganising too greatly the daily living cycle. Equally it will depend on the density of the population; the density of adjacent populations and, of course, the standard of structural protection to be adopted; the calibre of bombs anticipated; and the type of bombing.

Dispersal can, of course, only be justified on the grounds that it will increase national safety. It would seem, therefore, that before a system of dispersed shelters is adopted, the comparative practicability of dispersed and concentrated schemes should be assessed from all points of view in as far as obtainable data allows.

INFECTIOUS DISEASES.—Dispersal affects the possibility of the spread of infectious diseases and the development of epidemics, both favourably and adversely according to the standard of shelter amenity to be adopted. The factors governing these considerations have been fully discussed before, and reference should be made to W.T.B.P.40, *The Builder*, January 10, page 32.

MORAL.—It is not proposed to discuss whether a satisfactory moral may best be maintained in a population being subjected to continued bombing attacks by grouping or dispersing the population, beyond the observation that, as far as moral may be maintained by organisation there is certainly more scope for organisation in the concentrated rather than the dispersed system.

ECONOMIC FACTORS.—Where the standard of amenity to be provided for a shelter scheme is low—for instance, space and seating only being provided—there is less economic difference between a dispersed shelter scheme and a concentrated one. Nevertheless the grouped shelter will still be a more economic proposition, since the perimeter factor per person is less. (W.T.B.P.42, case *g*.)

However, where a high or comparatively high standard is to be provided—as by the provision of heating, lighting, forced ventilation and sanitation—the economic advantages of the concentrated system over the dispersed system are obvious.

Again, where a high standard of structural protection is to be adopted, there can be no question but that it would be economically impracticable to provide unit family shelters offering protection of the order of direct-hit resistance to one-ton bombs. Further, where such a standard of structural protection is concerned, there is little to be gained from dispersal, although in theory a dispersed scheme under some bombing conditions may still be superior.

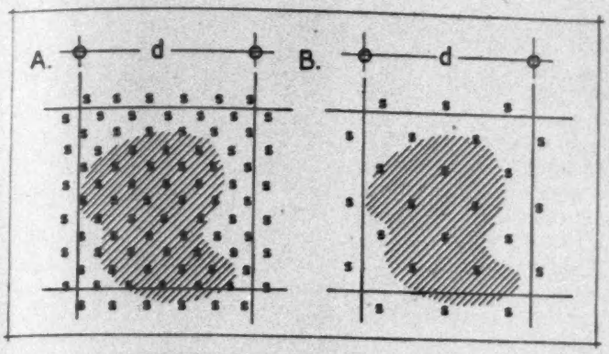


Diagram 4—RANDOM BOMBING. Effect of degree of population dispersal on relative extent of bomb distribution. A—Standard dispersal. B—Increased dispersal.

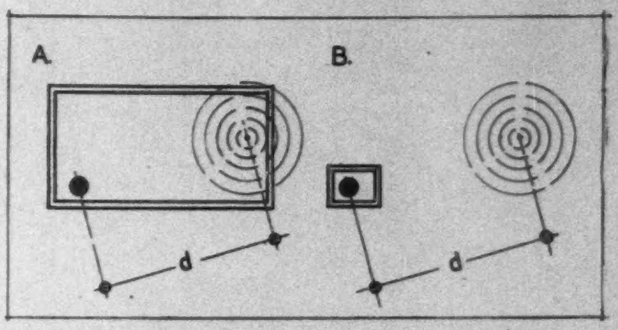


Diagram 5—RESTRICTED AND UNRESTRICTED EXPLOSIONS. Effect of size of shelter on safety of occupant. A—Restricted explosion. B—Unrestricted explosion.

It may at times be necessary to attempt to compare dispersed and concentrated schemes of the same cost per head with schemes where the saving in cost on the concentrated programme is expended on increased amenity or structural protection. It is, however, improbable that—except where the minimum standard of structural protection is to be comparatively high—were the saving in cost of the concentrated scheme against the dispersed one to be expended on increased structural protection, it would balance the increased safety of dispersal (assuming that expected bomb distribution and intensity would be such that dispersal offered advantages at all).

It will be appreciated that no attempt has been made to justify or condemn the policy of dispersal as a general principle for increasing protection. The factors controlling the effectiveness of dispersal are far too many and complex to justify any dogmatic assertions. The success of dispersal compared with the principle of using concentrated shelters does and must depend on local conditions, the general policy of protective standards agreed upon in relation to national economics, and the present and anticipated nature of the war.

Hypothetical arguments based on part only of these factors can only be expected to misrepresent the position.

(To be continued.)

SOCIETIES & INSTITUTIONS

R.I.B.A.

On February 4 the following members were elected :—

AS HON. FELLOW.

The Right Hon. Winston Spencer Churchill, P.C., C.H., M.P. (London).

AS HON. CORRESPONDING MEMBERS.

Walter R. McCornack (Cleveland, Ohio).
Frank Lloyd Wright (Spring Green, Wisconsin).

AS FELLOWS.

A. H. Gale (London).
A. J. A. Illingworth (Bristol).
E. B. O'Rorke, M.A. (Camb.), R.D.I., N.R.D (London).
T. Ritchie (London) (*Overseas.*)
G. S. Keesing (Sydney, N.S.W.).
F. R. Streeter (Ndola, Northern Rhodesia).

AS ASSOCIATES.

H. G. Bailey (Northwood, Middlesex).
C. K. Capon, A.A.Dipl., (A.A.), (London).
R. V. Crowe (A.A.), (London).
D. L. Dyson (Leeds Sch. of Arch.), (Leeds).
R. B. Holland (A.A.), (London).
P. B. Nash, Dip. Arch., Leeds, (Leeds Sch. of Arch.), (Huddersfield).
Miss S. B. Smith (A.A.), (London).
Miss J. Whatley (A.A.), (Treflach, Nr. Oswestry, Shropshire).
F. M. Widdup, Dip. Arch. (Distinction), (Leeds Sch. of Arch.), (Barnoldswick, via Colne).
(*Overseas.*)
A. J. Brandt (A.A.), (Shanghai).

AS LICENTIATES.

W. Beech (Walkden).
A. Buttle (Paignton).
J. Reid (Newcastle-upon-Tyne).
J. W. Rutter (Sunderland).

NORFOLK AND NORWICH ASSOCIATION OF ARCHITECTS.

Annual Meeting.

Speaking at the annual meeting of the Norfolk and Norwich Association of Architects, Mr. T. G. Scott, President, stated that it was said that architects will be very busy after the war. "We hope we shall be," he declared. "The skill of architects ought to be used to the full for the national good, and we hope we shall be allowed by good planning to avoid the faults common in the past because of blind absence of planning. Good planning means orderliness of arrangement, convenient and suitable for the purpose, whether it be buildings or cities, even as it does in aeroplanes and government.

"All buildings in the centre of great cities ought to be fire-resisting, and cities should not grow too large. Due consideration should be given to the needs of modern traffic in relation to the buildings, and the amenities must always govern the whole."

The officers and council were re-elected. A book prize for measured drawings was awarded to B. C. C. Hastings.

INSTITUTION OF STRUCTURAL ENGINEERS.

Following is a list of members elected December 19 :—

Studentship.—M. C. Privett, Fareham, Hants.

Graduateship.—J. V. Green, London; W. F. Lever, Cardiff; R. Partridge, Kilburnie, Ayrshire; and S. K. Sinha, Glasgow.

Associate Membership.—A. J. Bond, Warrington, Lancs; R. H. Newman, Napier, N.Z.; G. W. Spooner, Swansea; and W. S. Yates, Liverpool.

Associateship.—C. E. M. Fillmore, F.R.I.B.A., Birmingham; J. Watt, Huddersfield.

Membership.—H. T. Avey, Greenford, Middlesex.

The following members have been elected :

Studentship : R. F. Briggs, London; A. W. A. Crawshawe, London; J. H. V. de Alwis, Kelaniya, Ceylon; H. G. S. Lock, Norwich; P. J. N. Mockridge, Oxford; R. C. Wilson, London.

Graduateship : S. S. Cooke-Yarborough, Henley-on-Thames.

Associate-Membership : P. C. Chao, Shanghai**; J. C. Grassie, B.Sc., Aberdeen; G. R. B. Lloyd, North Cray, Kent*; W. L. N. Madeley, Edgbaston, Birmingham**; D. D. Matthews, M.A., M.Sc., A.M.Inst.C.E., Manchester; S. K. Y. Menon, Bezwada, India*.

Associateship : J. F. Bradford, Pulborough; H. F. Curtis, London; H. S. Edwards, Hinchley Wood; S. T. Saunders, London; A. Sickelmore, Wembley, Middx.

* Re-admission.

** Passed Associate-Membership Examination.

L.C.C. Architectural Assistants.

MR. F. C. WYLDE, L.R.I.B.A., a principal assistant (technical), and Mr. A. H. Boss, A.R.I.B.A., a senior assistant (technical) in the Architects' Department, retired on health grounds on January 31.

MAINTENANCE SCHOLARSHIPS IN ARCHITECTURE

THE Architects' Registration Council of the United Kingdom offer for award in June, 1941, certain Maintenance Scholarships in Architecture. The Scholarships will consist of a grant for the payment, in whole or in part, of the school fees and necessary subscriptions, instruments, books, etc., and, when necessary, a maintenance allowance not to exceed as a rule £100 a year. The Scholarships will be renewable from year to year until the student has finished his or her school training. They will be available for students of British nationality who could not otherwise afford such training to enable them to attend architectural schools approved by the Council. The Scholarships will be available both for students who have already begun their training and for students wishing to begin their training. They would not normally be granted to students under 17 years of age.

Particulars and forms of application may be obtained from the Secretary to the Board of Architectural Education, Architects' Registration Council of the United Kingdom, 68, Portland-place, London, W.1. Copies of previous years' examination papers may be obtained on payment of 6d. The closing date for the receipt of applications, duly completed, is March 19.

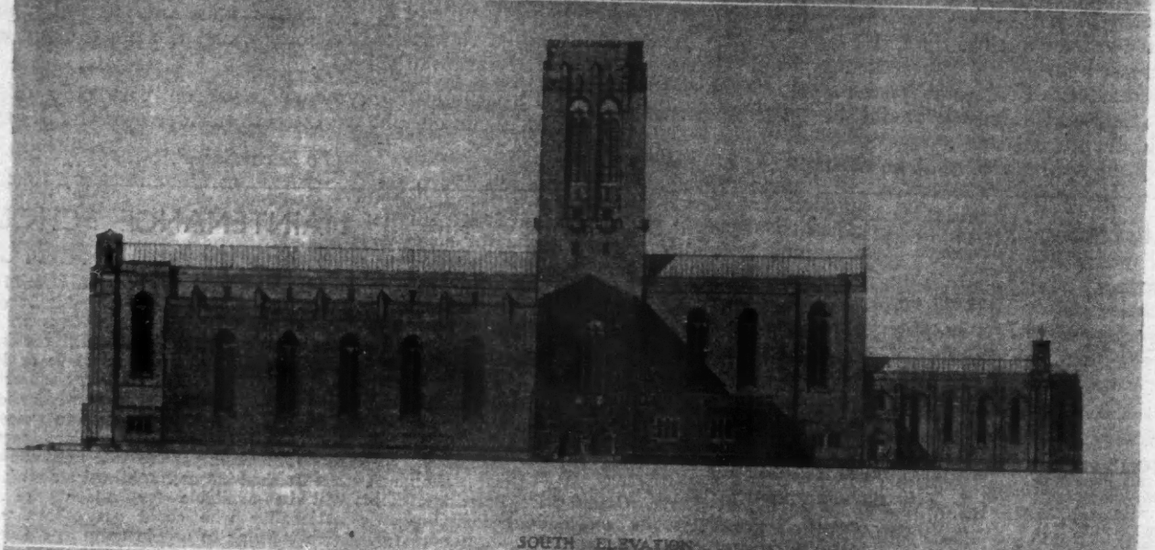
F. C. Lloyd, A.M.Inst.C.E.

We regret to record the death of Mr. F. C. Lloyd, Borough Engineer and Surveyor of Dagenham. Mr. Lloyd was A.M.Inst.C.E., M.Inst.M. & Cy.E. (Testamur) and a Fellow of the Institution of Structural Engineers. The Council has placed on record its deep appreciation of his loyal and devoted services.

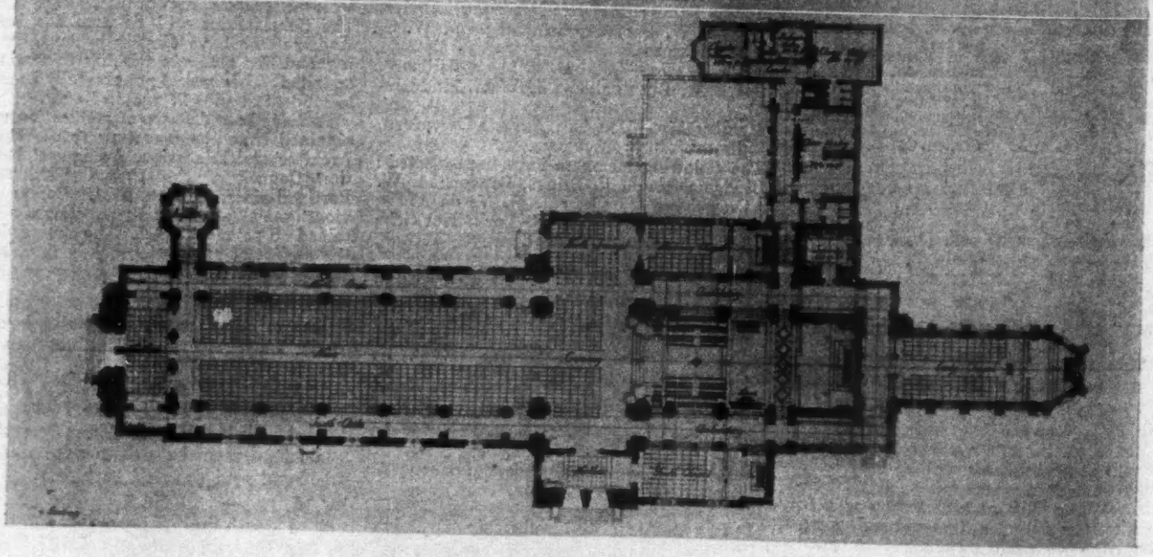
W. A. Bishop, L.R.I.B.A.

The death has occurred at Motherwell of Mr. William A. Bishop, L.R.I.B.A. Mr. Bishop, who was 59, received his early professional training in the office of the late Mr. Alexander Cullen, Motherwell, and had been in practice on his own account in the town for nearly 25 years. He was the architect of Motherwell's model child-welfare centre.

NORTH ELEVATION



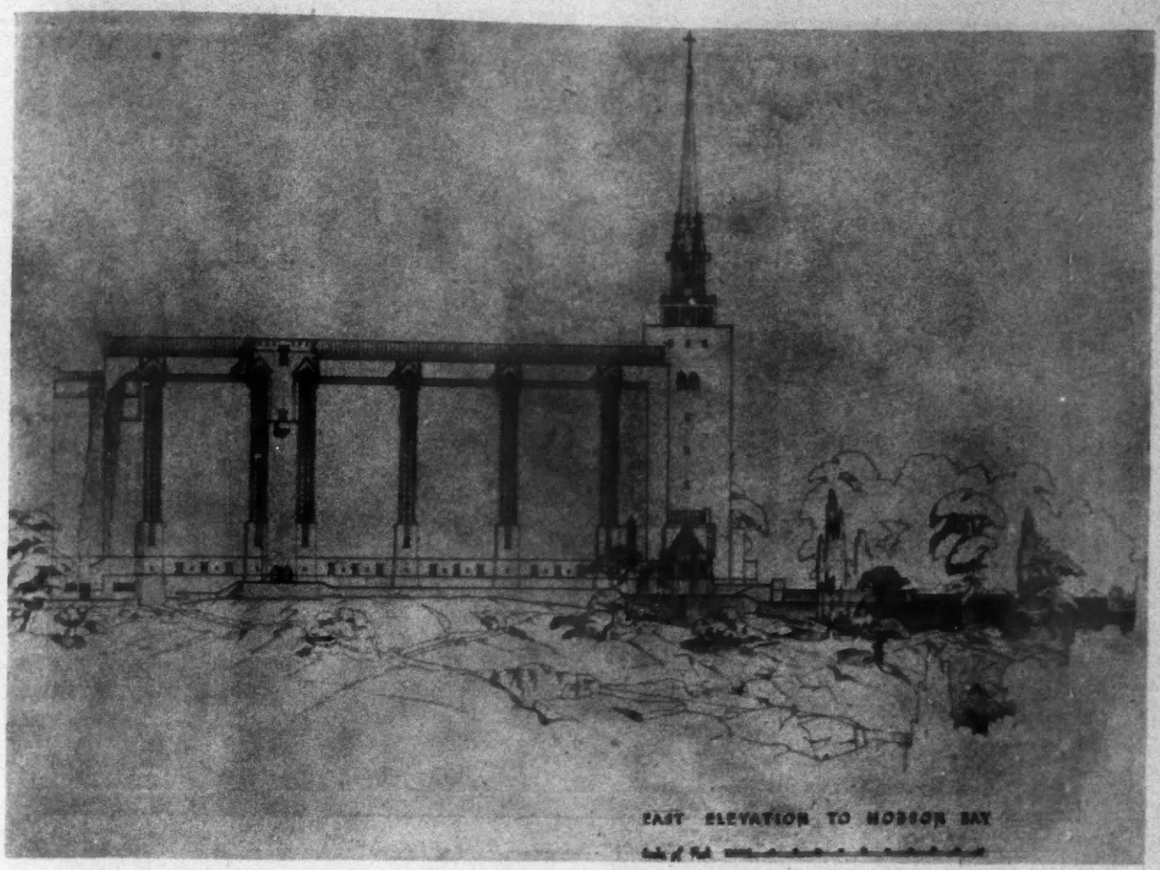
SOUTH ELEVATION

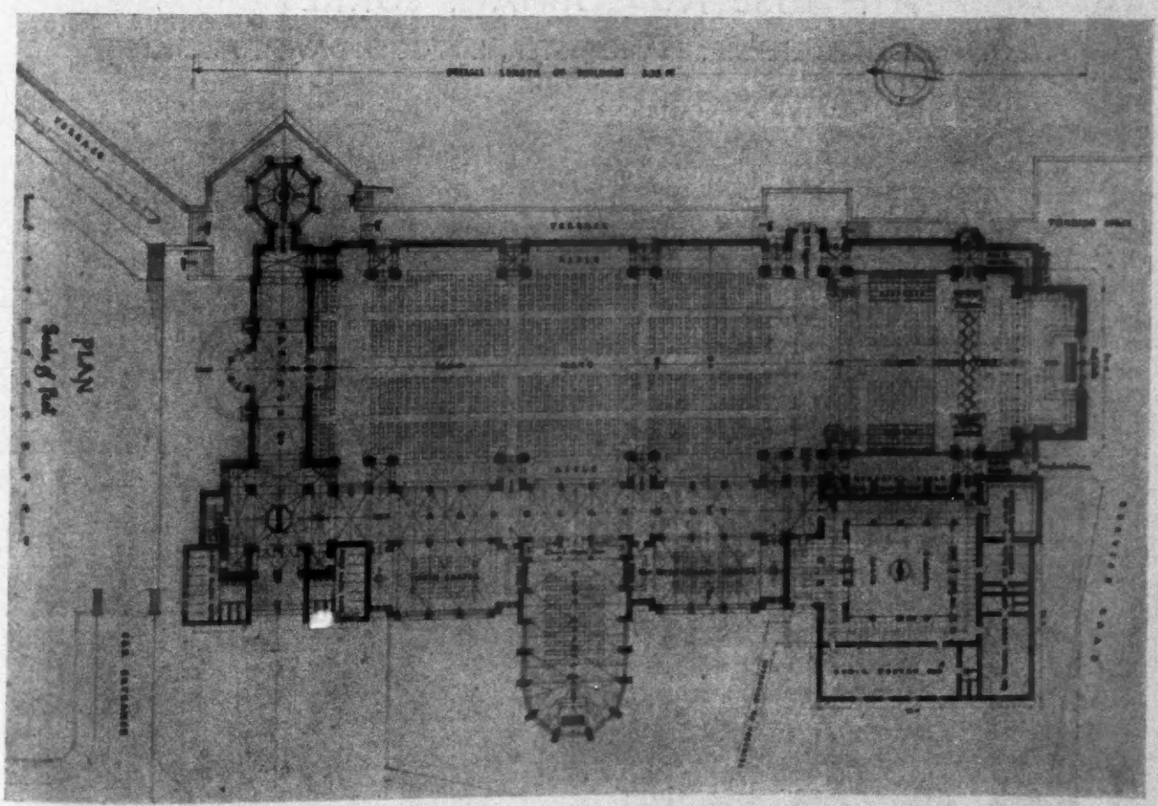


THE ACCOMMODATION IS 1092 IN NAVE, 60 IN NORTH TRANSEPT AND 108 IN WEST GALLERY—A TOTAL OF 1260. OCCASIONAL SEATING FOR 250 MORE CAN BE PROVIDED IN TRANSEPTS AND NAVE. THE THREE CHAPELS HOLD 250.

COMPETITION FOR CATHEDRAL FOR DIOCESE OF AUCKLAND, N.Z.

WINNING DESIGN: BY MR. CHARLES TOWLE, A.R.I.B.A., A.N.Z.I.A.





COMPETITION FOR CATHEDRAL FOR DIOCESE OF AUCKLAND, N.Z.

DESIGN PLACED SECOND: BY MR. AMYAS D. CONNELL, A.R.I.B.A., A.N.Z.I.A.

THE GARDEN FRONT. *Below* : ENTRANCE FRONT.

A HOUSE AT COBHAM, SURREY

MR. T. A. LODGE, F.R.I.B.A. (LANCHESTER, LODGE & DAVIS), ARCHITECT.

A HOUSE AT COBHAM, SURREY.

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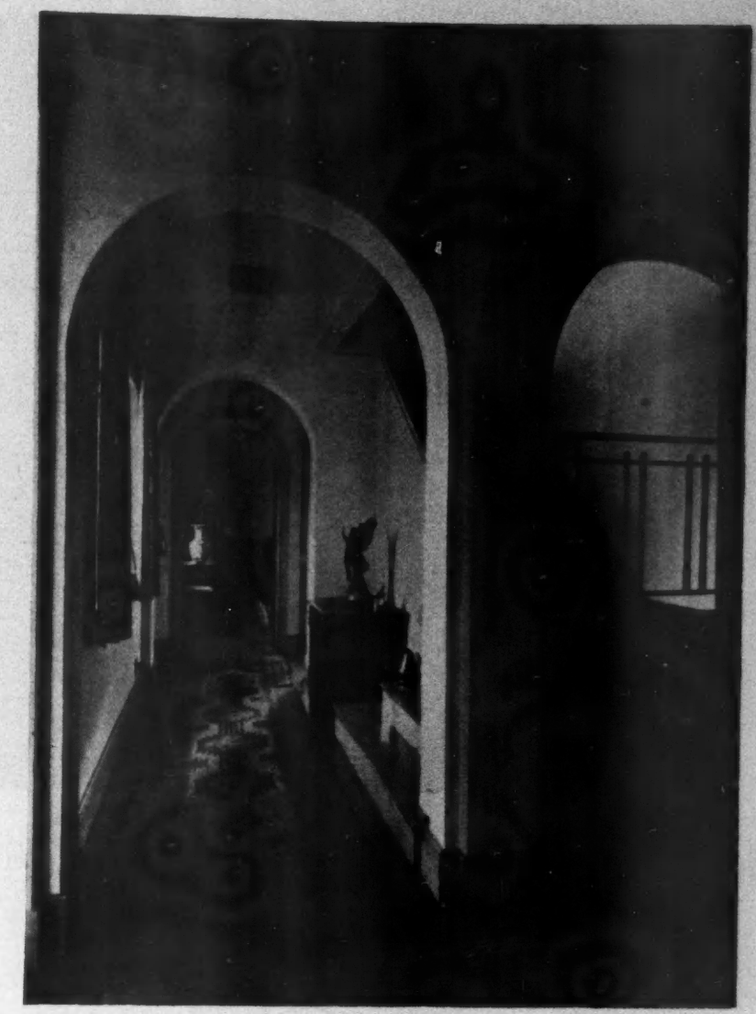
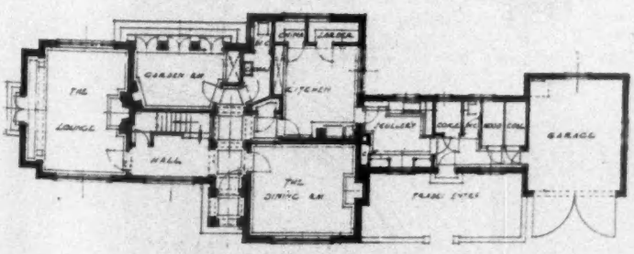
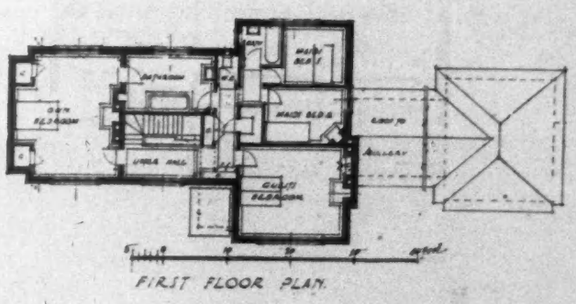


VIEW IN HALL.



GROUND FLOOR PLAN.



FIRST FLOOR PLAN.

This house, "The Laurels," Sandy Drive, Cobham, has been built by Mr. T. A. Lodge, F.R.I.B.A., for his own occupation.

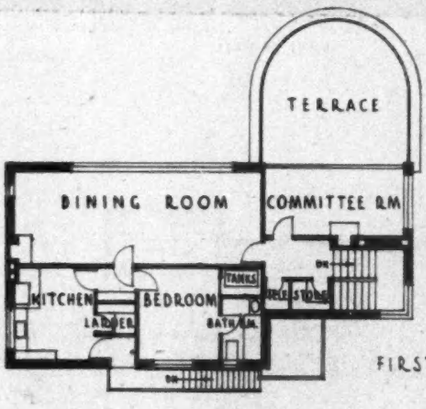
ACCOMMODATION.—Drawing-room, dining-room and small garden room. Four bedrooms and two bathrooms. Usual offices and garage for two cars.

MATERIALS.—1½-in. Belgian bricks, buff colour, built with wide joints of light colour cement. Thatched roof and metal windows with glazing in leaded lights. Staircase and all internal joinery is in oak, the staircase being enclosed with a low solid wall surmounted by a low wrought-iron handrail. The garden terrace walls were all constructed of the same bricks as the house.

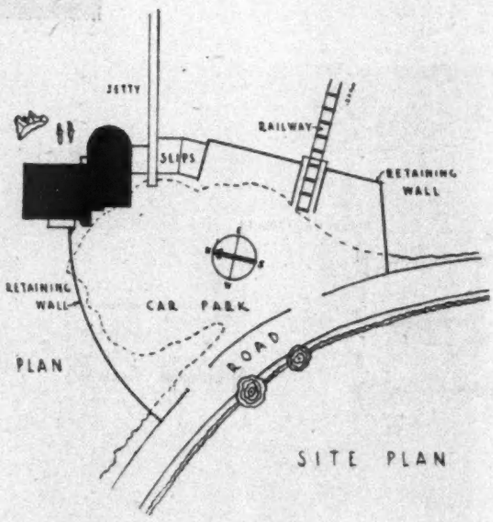
GARDEN.—The garden is about 3½ acres, part of which was originally woodland. A water garden and other rockeries were formed, making use of the natural amenities. The house was built by Messrs. Cropley Bros., of Epsom.

VIEW FROM THE LOUGH.

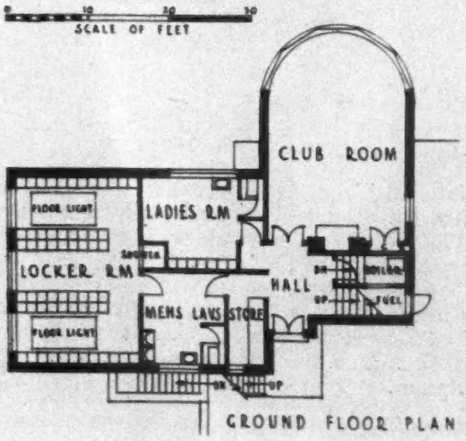
STRANGFORD LOUGH YACHT CLUB HOUSE, CO. DOWN.



FIRST FLOOR PLAN



SITE PLAN



GROUND FLOOR PLAN

MR. G. PHILIP BELL, B.ARCH., A.R.I.B.A., ARCHITECT.

VIEW FROM SOUTH, SHOWING ENTRANCE.

CLUB HOUSE FOR STRANGFORD LOUGH YACHT CLUB, CO. DOWN.

MR. G. PHILIP BELL, B.ARCH., A.R.I.B.A., ARCHITECT.

SITE.—The site for this clubhouse for the Strangford Lough Yacht Club, Whiterock, Co. Down, is a small piece of waste ground between a narrow coast-road and the shore of a sheltered bay—the yacht anchorage.

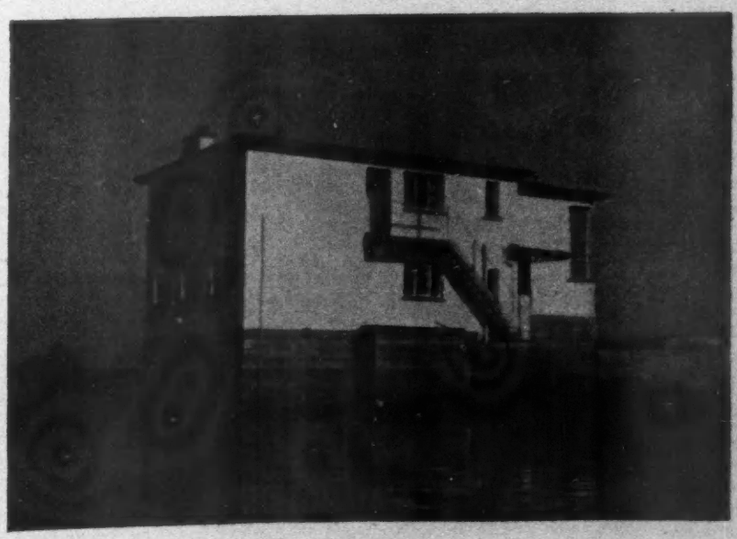
PLAN.—As a large car park was required, retaining walls were built to enlarge the site and the clubhouse was placed off dry land, with access only at one corner, where it was furthest from the road and had the best views. The ground-floor level was fixed 1 ft. above the record high tide, and this left height above the rocky shore for a waterproofed basement beneath, with outside access, for the storage of rough and heavy gear, the electric lighting plant, etc. Waterproofing was achieved by the incorporation of "Pudlo" in the concrete. Locker rooms and lavatories occupy most of the ground floor except for the club room. On the first floor, the committee room opens out on to the terrace with sliding doors. The kitchen and caretaker's quarters behind the dining-room are reached by outside stairs.

CONSTRUCTION.—Up to and including the ground floor and round bay to cill height—waterproofed reinforced concrete. Walls above—11-in. cavity-brick, rendered and roughcast with waterproofed cement. Partitions—4½-in. brick or studding and plasterboard. First floor and roofs—timber, the roof being covered with composite roofing and bitumen macadam.

FINISHES.—Basement left untreated from shuttering. Roughcast finished white. Gutters and external doors painted orange. Metal windows, railings and downpipes painted white. Other paintwork buff. Floors in locker rooms, etc., granolithic; entrance hall, quarry tiles; club room, oak blocks; stairs and first floor, linoleum. Ceilings: plaster on plasterboard painted. Walls: plastered and painted except for oak dado in club room. Internal woodwork stained or painted black. Metal windows painted grey.

LIGHTING AND HEATING.—Electric, from own plant. Open fires where shown, coal range and Calor gas for cooking, domestic hot water from boiler under stairs. Fresh water is from well pumped by electricity. Rainwater and salt water for w.c.s.

COST.—About £1,200, 11d. per cubic foot (excluding work to car-park). Messrs. Bell & Charters were the contractors.



VIEW FROM NORTH-WEST.

WHAT OF THE FUTURE?

By G. M. A.

IV.—ARCHITECTURE.

To have lived through the latter end of the nineteenth and the early years of the twentieth centuries is to have had the privilege of a rich experience, in which a dignified but somewhat stubborn age declined and gave place to newer things which have hardly yet taken an even approximately final shape. That architecture followed a similar course is not surprising, but must not be taken as a licence to blame all that has gone wrong with it to the symptoms of the age. Society is made up of many components, and each one must be severally tended that the whole may be healthy, and we should rather admit that in allowing our art to get out of hand we have contributed to the general chaos.

These two great wars have followed too closely one on the other; indeed, it seems now that it has been one long war, with but a brief armistice in which to bury our dead. But the fact remains that when we emerged from the first we did think we had put a stop to that sort of madness for all time, and that we were free to start a new and better age, so much improved over what had preceded it that similar events could no longer find a place in the scheme of things.

The young men saw that there had been an immense amount of pretence and a stupid worshipping of false gods in the life of his fathers, and he determined to break with the past and start afresh. He forgot that there was also an element of stability and dignity about the same manner of living, which showed handsomely through the more trivial pretences.

The young man in architecture took the same line. He saw in the slavish observance of period style something which stood in the way of live architecture. He saw things building in a different way, and yet dressed in the habit of a dead past. He saw the natural way of building constricted, and even distorted to fit this masquerade. What he did not see was that during the early years of the twentieth century much of the pretence was already falling off like a dead leaf, and that there was developing a certain harmony of manners among architects which bade fair to restore life to the main stem of tradition. If that healthy movement had been nursed to life, what a rich age of architecture it might have been in which we are living.

But, no, the young man preferred to seek his own miracle, and to profess that he had found it in concrete, a word which was for a brief spell magic, and which even now the modern designer cannot repudiate. The architecture of the future was to be a cast architecture, poured into a mould, cheap, clean and efficient, and the modern stylist modelled his limitations upon that prescription. The result was startling for a little while, monotonous with repetition, and finally just ugly and futile. Even the exponents are sickening for a change, but by their neglect of solid study have no capacity for satisfying this natural urge.

We must not let that happen again. We must hold firmly to the fact that no age is sufficient to itself, but must be an extension of the past, ripe for extension into the future. The bloodless revolution which must come, whatever else happens, must still look back as well as forward. It must find its marks among the things which have really happened before determining what is to happen in the future. Post-war architecture must declare its origin as well as its destination, and the task will be far more difficult than that which the young modernist of this passing generation set himself.

The first lesson seems to be that efficiency is a means to an end and not an end in itself, still less an inspiration. Alone it is inhuman, but in its proper setting it can contribute to the warmth of human feeling without which life is not worth living. Those who have taken the word as the key to all doors are those who have brought about this cold and unresponsive thing which we call modern architecture, and it is they who will have to make the biggest change in their beliefs.

At first sight it might seem that too much has been destroyed to restore the old reverence for tradition, but it should be remembered that there are still many in active practice who were trained on the old lines and who have not forgotten a sound grounding. Some of these have flirted with the new ideas and a few have sold themselves to revolution. But a great many of them, without fuss or self-advertisement, still operate as though the modernist movement had never taken place. Much of contemporary architecture has something in common with the graces of King Edward VII and many contemporary architects in many ways had reached a more settled frame of mind than those of that age. If they have learned anything positive from the new movement it has been in the direction of simplicity and restraint, qualities which sit kindly in any architectural framework.

It must not be assumed that this is a plea for some specific revival. It is merely a plea for a return to the wider qualities in design which have infused more than bare essentials of construction into an expression of architecture. If it does, indeed, suggest anything to be revived, it is a matter of spirit rather than of period style.

A great opportunity faces the architect of to-day and of to-morrow, and if this opportunity is frittered away the future of the race seems to be a gloomy one.

(To be continued.)

(*Continued from next column.*)

(see Allow).

Prime cost (P.C.).—Is an approximate amount to be provided by the contractor and allowed for in his tender, from which he is to supply, or purchase from a merchant or supplier certain *small* items indicated.

Provisional sum.—Is an approximate amount to be provided by the contractor, as above, but for the purchase of a large article or for work to be done by a sub-contractor.

Rebuild.—To rebuild the whole structure.

Repair.—Patching, or renewing parts.

Schedule of prices.—A list of items giving a fixed scale of prices of them.

The Several Works.—The whole of the works covered by the contract.

Strikes.—Cessation of work by those employed.

Structure.—Anything built or assembled.

Substantial completion. — Completion which justifies the issue of the final certificate.

Vary.—To order extras and/or omissions.

Weekly accounts.—Accounts of daywork presented week by week.

INTENTIONS, USAGES AND CUSTOMS

By W. T. CRESWELL, K.C., Hon.A.R.I.B.A., A.S.I., etc.

In an article published in *The Builder* for January 31, under the above title, it was pointed out that any agreement must be construed with due reference to any particular usages or customs generally honoured in the sphere of its subject matter; and that parole evidence is therefore always admissible to show clearly what special meaning such usages and customs give to the terms of the agreement. This applies also to an agreement itself made between the parties by parole only, and following the usual parole evidence in regard to what, in fact, were the nature and the terms of the unwritten agreement.

In order that the Court will accept that any alleged usage or custom is to affect the terms of a legal agreement, the usage or custom must be reasonable in its operation. It is then accepted as confirmatory evidence, if it does not contradict or vary the obvious purpose of the contract or the general intentions of the parties.

There are certain terms appearing in most building and engineering contracts which have acquired a definition generally accepted by the Courts and other judicial tribunals, in the course of case law. The following glossary collects those appearing most often :—

Abutting.—In actual contact with.

Act of God.—The effect of a force of nature which no reasonable foresight or usual ability could have foreseen or provided against.

Acceptance.—Assent and agreement to an offer.

Adjacent, adjoining.—Absolutely contiguous; nothing else between.

Allow.—Introduces an item to be left to the choice of the contractor (see Provide).

Approval.—Approval with full knowledge.

Approved plan.—A plan lawfully approved by a local authority.

As far as possible.—Consistent with reasonable trade requirements.

Brick-built.—Brick-built in the literal sense.

Builder.— The person who is employed to build or the person who actually builds, *i.e.*, the owner, etc.

Building.—A structure with walls and roof.

Building line.—The line usually fixed beyond which no part of any building must project when land is laid out or developed for building purposes.

Completion.—Certified completion.

Daywork.—Work paid for by the hour and materials used.

Entire contract, lump-sum, or firm contract.—Contracts to complete the whole of the work for an agreed amount.

Establishment charges.—Costs that can rightly be attributed to, and caused by, the work carried out.

Estimate.—A valuation in advance.

External parts.—The exposed walls.

Extras.—Work and materials not expressly or impliedly described in the contract.

Liquidated damages.—Fixed or ascertained damages.

Maintain.—To keep in a good condition as left or found.

Necessary.—That which is *properly* to be required.

Negligence.— Not doing that which a prudent man would do, or doing that which a prudent man would not do, when under a duty to use care, and thereby causing damage.

Offer, tender.—Something which invites acceptance.

Penalty.—A sum of money payable as compensation for a failure to carry out terms of contract.

Plastering.—Does not include gauging.

Provide.—Introduces an item to be left to the choice of the architect and the employer

(*Continued at foot of previous column.*)

GOVERNMENT CONTRACTS

SELECT COMMITTEE'S SUGGESTIONS FOR CO-ORDINATION.

THE Fourth Report from the Select Committee on National Expenditure, being the Eighteenth Report in the series of Reports from the Select Committees on National Expenditure originally set up in session 1939-1940, has now been published (Stationery Office, price 9d. net).

In the Committee's second report, the Sub-Committee (whose Report was adopted by the Committee) drew attention to the need for strengthening the machinery designed to secure co-ordination between the main contracting departments. The present Report arises from that matter, and the Committee now endorse the proposals which are summarised below:—

In the forefront of their conclusions they place their recognition of the vital part which sound principles of contract procedure must play in the efficient and economical provision of war supplies, and of the need for strengthening the independence of contracts branches so that they have both the information, the staff and the power to carry out to the full their duty of securing economy in Government buying (paragraphs 101-103). As one means of avoiding ambiguity and waste of time in negotiations, the Sub-Committee recommend that an agreed list of definitions of the technical terms used in such negotiations should be drawn up and published (paragraph 11).

(a) Types of Contract and Methods of Costing.

The Sub-Committee recognise that there is no single form of contract which will meet every case. Where special circumstances arise (such as the fact that a particular firm is highly efficient and has every indirect inducement to retain its economic efficiency), and better results are likely to be had by the use of an apparently less efficient form of contract, there should be no barrier to making such an agreement; but the Sub-Committee recommend that the following rules should be generally applied, and that proposals to depart from them should be subjected to special scrutiny by the Treasury:—

(i) Cost plus contracts should not be made for any work or product which is not novel in character, and should then only be made for the experimental phase, when even a maximum price cannot be fixed, as a means of arriving at an estimate of what continued or straight-run production is likely to cost. There may, however, be a few wholly exceptional cases where cost plus methods must be condoned on grounds of extreme urgency; but this only applies to work which it is essential to begin *and to complete* within a matter of days. Where the nature of the work is such that completion within a very short period is impossible, the cost plus method is more likely to delay than to expedite delivery, and is certain to increase costs.

(ii) Maximum price contracts may be necessary when enough experience has not already been gained to arrive at a closer estimate, and whenever possible they should be associated with a target figure below the maximum.

(iii) When a target is used, sufficient inducement, direct or indirect, should be given to the contractor to effect savings. The real use of both these methods is a prelude to the fixing of a fair price for future contracts; they are expedients to cover a period during which information on costs of production can be collected and the difficulties of the less efficient firms be detected and overcome.

(iv) Apart from these special circumstances, every effort should be made to place contracts on a fixed price basis, and to this end full use should be made of data derived from previous experience, the examination where possible of market prices, and the results of cost investigation.

(v) In applying competitive tendering, regard should be paid to idle capacity and to the question whether this is the quickest and most efficient method of arriving at a fair fixed price. Otherwise, reliance should be placed on direct agreements based on full cost estimation. In particular (paragraph 80), far greater use should be made of technical costing as the basis for future contracts placed by the Ministry of Supply.

(vi) Post costing should be recognised as a means of providing information leading to fixed prices based on technical costing. Though the right to ascertain actual costs, even in some fixed price contracts, should be preserved, post costing by departmental accountants should be applied in detail only to those contracts which it is essential to cost for informative purposes and to others at random as circumstances and time permit (see (iii) below).

(b) The Examination of Costs.

The Sub-Committee recommend:—

(i) That closer scrutiny should be given by departments to the costs allowed for labour on costed contracts with a view to securing that it shall be employed in the most efficient manner (paragraph 27).

(ii) That, to secure a comparison of the ascertained costs of different firms, greater uniformity in methods of allocating overheads to particular work should be adopted within groups of firms engaged on similar work under similar conditions; that a clear and agreed decision on allowable overheads should be reached so that contractors understand their obligations before work is begun; and that an *ad hoc* committee be appointed by the Treasury to consider the whole treatment of overhead costs (paragraphs 28 and 29).

(iii) That the systems of cost accounting already in use by contracting firms should be studied, and efforts should be made in the case of groups of industries to agree upon modifications with a view to reducing departmental costing and when possible accepting the firm's figures as certified by auditors, but subject to departmental "spot checks"; that departmental costing methods should be simplified and as far as possible standardised; that cost examinations should be made at the earliest possible time so as to accelerate both payments and the provision of information; and that duplication of costing of the same firm by different departments should be stopped at once (paragraphs 39, 41-44).

(iv) That greater use should be made of current costings by getting periodical returns of the figures taken out by firms during production, or that "snap audits" might be taken before completion so as to provide early information for the fixing of future prices; and that where applicable the method of process costing, as opposed to unit costing, should be used (paragraphs 45 and 46).

(v) That on the information received through the Progress, Area and Costings organisations, lists of contractors graded in accordance with the quality of their work should be drawn up to guide the contracts branch in the placing of further orders (paragraph 48).

(c) Profits.

The Sub-Committee recommend:—

That rates of profit should be related to capital employed; and that some degree of uniformity is highly desirable; but, since a simple fixed rate is hardly feasible, agreements to cover particular industries should be encouraged, though some flexibility should be retained to offer special incentives for special efforts (paragraphs 58-63).

(d) Sub-contracting and the Employment of Small Firms.

The Sub-Committee attach great importance to the fullest use being made of the capacity of small firms, and they therefore welcome the work of the new Area Boards. They recommend:—

(i) That the use of the "parent firm" and "embodiment loan" schemes should be extended (paragraphs 64-72).

(ii) That the question of credit facilities should receive further attention; that all payments due should be sanctioned and made without delay; and that, where final payments cannot be made, payments on account should be sanctioned as early as possible (paragraph 74).

(iii) That the Treasury should give immediate attention to the question of the profits allowable to the main contractor on sub-contracted work; and that the responsibility for "progressing" sub-contracted work should be clearly fixed either on the main contractor or on the Progress organisation (pars. 73 and 75).

(e) Departmental Organisation.

The Sub-Committee again draw attention to the difficulties that, under war conditions, spring from the autonomy of the separate Departments which are jointly concerned in what must be regarded as a single undertaking. The problem goes deeper than the mere provision of liaison facilities and involves constitutional questions which are not within the competence of the Sub-Committee. But it is within their scope to proffer any constructive suggestions which they hope may conduce to greater efficiency and economy within the existing framework. They do not forget that what may be readily criticised may not be so easily corrected. For instance, the need for the avoidance of delays is obvious; but the resultant difficulties may not always be appreciated by those who have not experienced them and who are intent on their own problems. This applies particularly to the putting in of demands and to the placing of orders. If, on the one hand, the overloading of particular firms and, on the other, gaps in production are to be prevented, it must be impressed on ordering branches that information in terms of approximate quantities of stores should reach the Supply and Contracts branches in time to allow of careful allocation and negotiation. It is equally important that this information should reach the contractor before the completion of his current orders, so that he may plan accordingly (paragraphs 9 and 54).

The Sub-Committee further recommend:—

(i) That arrangements should be made for Intelligence and Statistical branches to collect information and to analyse and compare the figures received from costing and other sources so as to provide Contracts officers as early as possible with a sound basis for their negotiations and criticisms (pars. 41-44, 101-3).

(ii) That contract procedure should be brought under a more direct and unified control with sufficient authority to overcome departmental prejudices (paragraph 89); that the Contracts Co-ordinating Committee, or a sub-committee appointed *ad hoc*, should, with the help of industrial representatives, consider the greater standardisation of general conditions of contract and draw up common form clauses which should not be varied in individual contracts without the authority of the permanent chairman of the main committee; that the permanent chairman should be free to devote his entire time to matters directly connected with the work of the Contracts Co-ordinating Committee; and that the composition of the committee should be strengthened by the addition of officers who could study the market and the trade information available (paragraphs 89-94).

(iii) That the spheres of the Supply and Contracts branches of the Admiralty, the Ministry of Aircraft Production and the Ministry of Supply should be reconsidered with a view to securing a more rational distribution of functions based on the general principle of reducing the number of Departments dealing with the same industry or firm (paragraphs 105 and 106); that the purchase of general stores, clothing and personal equipment should be the function of a separate new branch (paragraph 107); and that, with the exceptions noted, all constructional building, whether for Civil or Service Departments, should in future be the responsibility of the Ministry of Works and Buildings (paragraph 108).

SINGLE STOREY WAR-TIME FACTORY DESIGNS

WAR TIME BULLETIN C.12.

"SINGLE Storey Wartime Factory Designs" is the subject of War Time Bulletin No. C.12, issued by the Ministry of Home Security (Research and Experiments Branch) recently. Following is the text:—

1. Introduction.

A main object of air attack is to paralyse production. By dropping high explosive and incendiary bombs the enemy seeks to demolish or burn out factory buildings, ruin the plant and kill, maim, or at least demoralise, the workers. Fortunately for the defence, wartime designers can do much to make factories highly resistant to collapse and difficult to fire, damage can be localised and the steadiness of the workers reinforced by giving them cover at hand. The intelligent development of the design methods advocated is regarded as an important counter in maintaining production despite air attack.

Serious as has been the structural damage caused by high explosive bombs to certain factories, the effects of high explosives are not so deadly as the effects of fire. Up to the present far more steelwork has been destroyed by fire than by high explosives.

The simplest way of minimising fire damage is to limit the combustible materials in the factory to the essential minimum. This applies also to the roof, where timber purlins or any form of slates or tiles on boarding should on no account be used. Correct planning of a factory can play at least as big a part in minimising bomb damage as correct structural design.

The tendency towards very large buildings, which is so marked to-day, should be reversed. In the event of a direct hit by a large bomb all the glass and roofing material in the building, almost irrespective of its size, will be destroyed. Even in a small building the explosion will to some extent be confined by the walls and roof, and adjacent buildings will be relatively undamaged.

It therefore follows that it is preferable to sub-divide a factory into as many units as possible, rather than to concentrate everything into one large building. This has the additional advantage of minimising the area likely to be destroyed by fire. Moreover, it may be possible to arrange production in several parallel lines, so that if a link in one line is destroyed, it can be by-passed and production need not be seriously interfered with.

2. Principles of Design.

By far the most common type of factory for wartime production is the single-storey building, and this Bulletin is concerned with the principles of design applicable to this type. The first principle is that all loads should be carried by a framework of steel or reinforced concrete. Load-bearing walls are dangerous because an explosion can demolish instantly long lengths of walling, bringing down with them all that rests on them.

So far little experience of the behaviour of reinforced concrete frames has been obtained. It is known that a reinforced concrete member is more severely damaged by a direct hit than a comparable steel member. It may, therefore, be impossible to eliminate collapse entirely in reinforced concrete framed buildings. The evidence so far available suggests, however, that where reinforced concrete is used the most satisfactory way of minimising damage is to divide the framework into as many discontinuous units as possible, thus localising any collapse that may occur. In the meantime, this Bulletin is addressed primarily to the problems of design in steel.

3. Steel Framing.

The second principle is that the steel frame should resist collapse notwithstanding the sudden removal of any one main member. This is not so rigorous as it sounds. Near the explosion the load is generally relieved by the roof covering being blown away, and there have been a number of cases where direct hits have severed either the rafter or the main tie of a steel roof truss without even producing a measurable sag.

The chief risk to roof steelwork arises from the violent displacement of a stanchion foundation, and the consequent shearing of the stanchion cap connection leading to collapse of roof trusses. This risk is eliminated if two simple precautions are taken. The cap connection of the stanchion to the roof member should be made stronger than is usual in order that it shall not be sheared off, even if the stanchion base is shifted 4 or 5 in. by a near miss. This precaution is particularly necessary in the case of trusses or beams framing into external stanchions. In addition to the effects of ground movement, such stanchions are liable to be subjected to a considerable horizontal blast pressure applied to them by whatever wall construction is adopted. Provided their cap connections are adequate, however, the worst effect of this blast will be to bow out the stanchions without causing any major damage or collapse. In addition, the roof girder or valley beam should be spliced so as to be continuous. This will ensure that, even if a stanchion is destroyed, the valley beam is adequate to carry the dead load only of the roof (without the sheeting) over two bays. These precautions will not serve if two adjacent stanchions are destroyed, and a stanchion spacing of at least 30 ft. each way is desirable to prevent this.

An explosion inside a factory forces the roof upwards and the steelwork should be designed to resist this by using angles rather than flats for all tension members and by attention to the roof covering as suggested in Section 5.

Generally speaking, the experience of recent air raids has indicated that the roof types recommended in Wartime Building Bulletins No. 1 and 4* are the best possible from the point of view of resistance to air attack provided that they are fully steel framed. The following points should however be borne in mind in relation to the individual types; the modfications suggested below are being made to the type designs and will be given in Wartime Building Bulletin No. 10.

TYPE B.—SHEETED ROOF, CONSISTING OF SYMMETRICAL ROOF TRUSSES CARRIED ON VALLEY BEAMS.—Experience shows that it is only by the destruction of a stanchion that any collapse of this type of roof can be eliminated. This danger can be eliminated if the valley beam splices are designed to develop such a strength that the dead load only of the roof (without the sheeting) can be carried over two bays.

TYPE C.—SHEETED ROOF, CONSISTING OF SYMMETRICAL "UMBRELLA" TRUSSES CANTILEVERING ON EITHER SIDE OF APEX LATTICE GIRDERS.—This type was included in the Bulletin in preference to the more usual north light type solely with a view to its inherent resistance to collapse. If full advantage is to be taken of this, minor amendment to the original design is necessary. The lattice girders should be strengthened to enable them to act as continuous girders.

Even if the precautions outlined above are taken there is the possibility that fire or other unforeseen occurrences will bring down a portion of the steelwork. In this event it is essential that the collapse should be localised and should have no tendency to spread and involve the adjoining undamaged steelwork. The only form of spreading collapse to which the above types are liable occurs with Type B, and may happen if a number of adjacent trussses in the same bay collapse. The purlins may then apply an excessive horizontal pull to the neighbouring trusses pulling them over and producing a spreading collapse. This danger can be guarded against by providing at intervals in each bay wind bracing capable of sustaining any pull which the purlins can transmit.

4. Walls.

The external walls of a wartime factory should be regarded as simply protective screens against weather and bomb fragments. The danger attendant on load-bearing walls has been mentioned already. Hence the external walls should consist of panels of the materials and thicknesses *specified in the* Revised Code.† Such laterally protective panels should not be built into the webs of steel stanchions but should be butt jointed against the concrete or brick with which the stanchions should be encased. If the height of the panels is 6 or 7 ft. above the factory floor level, this will suffice for lateral protection. In the space between the top of the panels and the eaves of the roof sheeting on steel framing should be fitted. Panels and sheeting should be so designed that blast damage shall not be transmitted by them to the framing. To ensure that the sheeting shall blow in harmlessly it should be of asbestos-cement or other brittle material with anti-scatter protection by means of wire or sisal netting which may be of large mesh, securely fixed to the steel framing behind the sheeting. The use of corrugated steel sheeting is not recommended for walls, as although it will blow out harmlessly from a hit inside the building it is liable to cause considerable buckling of the steelwork under the effects of a near miss outside the building.

If natural illumination is regarded as essential the space above the dwarf walls may be glazed preferably with a translucent flexible glass substitute (see Bulletin C.10‡). If glass is used it should be covered internally with wire netting not exceeding ½-in. mesh, securely fixed to the structure.

In non-essential buildings if load bearing brick walls or piers are used to economise steel, similar principles of construction should be adopted. Load bearing brick piers should be used in preference to continuous brick load bearing walls. The height of the panels and the space between top of panel and eaves should follow the principles advocated above for framed structures. The panels should be of the materials and thicknesses specified in the Revised Code.

The use of lightweight internal partitions to subdivide a factory should be avoided. Such partitions are particularly liable to blast

*"Economical Type Designs in Structural Steelwork for Single-storey Factories." H.M. Stationery Office, London. (*The Builder*, May 10 and July 5, 1940.)

†"Air Raid Shelters for Persons Working in Factories, Mines and Commercial Buildings." Revised Code. H.M. Stationery Office, price 6d.

‡Flexible Substitutes for Glass (Research and Experiments Department, Ministry of Home Security, *The Builder*, September 27, 1940.

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damage, and if glazed or sheeted with a brittle material they are a serious source of danger to personnel.

Substantial internal partitions, however, can be designed to afford a considerable measure of protection. If they are built the full height of the shop they will provide useful fire stops and may limit blast damage to the roof. They should be framed in steel or reinforced concrete independent of the main structure.

5. Roof Covering.

(*a*) PROTECTED ROOFS (TYPE A OF WARTIME BUILDING BULLETIN No. 1).—Flat roof incorporating monitor lights and giving overhead protection by a 4-in. reinforced concrete slab).

The little evidence so far available on the behaviour of this type of roof under the effects of direct hits and near misses indicates that it should afford considerable protection to the factory from debris thrown up from bomb craters. It may even give some protection to plant against the effects of those light bombs which, being instantaneously fused, explode when they strike the roof. Such a bomb would merely blow a hole about 5 ft. square in the roof with relatively little damage to the interior of the factory.

The effect of a large bomb exploding inside a factory is, however, likely to be much more serious. The reinforced concrete roof slabs will undoubtedly be lifted over a fairly wide area. It is possible that they may also be displaced slightly and fall back into the shop instead of on to the supporting steelwork. Should this occur the roof slabs would do even more damage than the bomb, and this eventuality must be guarded against at all costs. The best safeguard would be to anchor the slabs to the steel framework. Such anchorage need not be of any great strength, but it should be designed to withstand an uplift pressure on the roof of at least 100 lb. per sq. ft. Alternatively, the slabs may be linked together. A saving of steel could be effected if the slabs were designed to be continuous, such continuity being provided by additional top reinforcement placed in position and grouted in after the slabs are erected.

(*b*) SHEETED ROOFS (TYPES B AND C OF WARTIME BUILDING BULLETIN No. 1).—Roofs are less subject to external blast from a near miss than are walls. The objection to the use of corrugated steel for walls does not, therefore, apply to sheeted roofs, for which it is the ideal covering. The area of sheeting likely to be destroyed by a direct hit is about fifteen times as great for asbestos cement as for corrugated iron. The spacing of hook bolts usual with corrugated steel sheeting, about one to every 6 to 8 sq. ft. of roof, is sound. With this spacing, the hook bolts being slightly weaker than the purlins, the sheeting will be blown off without damaging the purlins. With a closer spacing of hook bolts, the purlins would be liable to extensive damage and with a wider spacing an unnecessarily large area of sheeting be stripped. Proprietary forms of sheeting consisting of flat or corrugated steel sheets coated with a waterproofing compound behave in a similar manner to corrugated steel. The resistance of asbestos cement sheeting to blast can be considerably increased by reinforcing it, preferably with light-gauge sheet steel. Such sheeting reinforced with fabric tape has a considerably greater resistance to impact loads than unreinforced sheeting. No evidence is, however, so far available as to the areas of reinforced asbestos cement sheeting likely to be damaged by the blast from a direct hit.

Insulating board lining under sheeted roofs should on no account be used. Under a direct hit such a lining does not save the roof sheeting and causes extensive damage to the roof steelwork. Unlined roof sheeting fixed in the usual way is capable of being blown off without damage to the steelwork. The presence of the lining, however, results in an excessive uplift being applied to the steelwork, and may cause very extensive damage to it.

6. Roof Glazing.

A main cause of delay in returning to full production in bombed factories has been extensive damage to roof glazing, which has all to be repaired before night work can be resumed. For this reason, it is most desirable that roof glazing should be entirely eliminated from new factories, work being carried out solely by artificial light.

For ease of conversion in peace time it may be desirable to make arrangements for future glazing to be inserted. This can be done by designing a normally glazed roof and replacing the glass by flat sheets of weatherproof material. Such materials should be similar in strength and elasticity to the sheeting used on the roof.

If it is considered essential to maintain natural illumination the minimum amount of glass, or preferably of flexible glass substitute, to give the required lighting should be used.

Provided that wired glass is used and is supported by battens fixed between the glazing bars, it is possible that it may remain weatherproof under fairly severe blast. Even with these precautions, however, the danger of falling glass is not eliminated, and wire netting, which may be of a fairly coarse mesh, should be securely fixed beneath the glass. If unwired glass is used, wire netting of not more than ½-in. mesh should be provided underneath it.

7. Services.

Gas, water and electricity services are particularly liable to bomb damage. In many cases cast-iron and other buried pipes have been fractured by ground movement at a distance from the bomb explosion. Sometimes the fracture has not been discovered until the plant has been started up again, and a further delay in production has occurred until the services have been repaired.

In new factories, this danger can be largely eliminated by isolating the service pipes from the effects of ground movement. The principle should be to provide an air space between the pipe and the surrounding ground. This can be done in several ways. The pipes can be laid in ducts, or in certain cases guard trenches can be provided on each side of important service pipes.

8. Additional Measures for the Protection of Personnel and Plant.

In view of the danger of air attack without warning and of continuing work until the last minute after the alert signal has been received, it is esential that the air-raid shelters provided for personnel should be at hand. Wherever possible shelters should be in the form of covered trenches under the floor of the shop with entrances suitably traversed at frequent intervals. Where it is impossible to have the entrances to shelters very close to the place of work, emergency protection must be provided as set out in A.R.P. Memorandum No. 16, "Emergency Protection in Factories."

Where the structure has been designed as described in this bulletin cover in the form of dwarf walls below benches will provide the worker with satisfactory protection.

The protection of plant is vital and can be provided simply. Individual machines should be protected against blast and splinters wherever possible by traverse walls, at least as high as the machine, and, where practicable, by a substantial roof.

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LONDON MASTER BUILDERS' ASSOCIATION

ANNUAL GENERAL MEETING.

THE sixty-ninth annual general meeting of the London Master Builders' Association was held on January 16, when the chair was occupied by the President, Mr. H. B. Kerr (Messrs. James Carmichael (Contractors), Ltd.), and 145 members were present.

The President, after fully reviewing the work of the Association during the past twelve months, moved the adoption of the annual report, which was carried unanimously.

Upon the motion of the President it was resolved unanimously: "That Mr. Clifford C. Trollope (Messrs. Trollope and Colls, Ltd.) be elected President."

Mr. Trollope, in returning thanks to Mr. Kerr for proposing his election as President, said: "Mr. Kerr has referred to the work of the Association during the past year, and we now shall have to turn our attention to the future, and all that lies ahead of us.

"I would remind you that the object of the Association is the promotion and protection of the interest of its members. To enable these principles to continue—not only under the present conditions but even more so in post-war developments—we must have unity and strength amongst ourselves.

"We shall require all the support we can give one another, with constructive criticism so as to steer the Association through the many problems with which we shall be faced, such as the power of the Labour Party and the control to be exercised by the Ministry of Works and Buildings, which we hope will not prove obstructive to progress or tend to destroy initiative but will assist the industry in planning and reconstruction.

"As any legislation will no doubt have the closest attention of our national body, we must be able to make our weight felt through them if necessary, in maintaining close liaison with the representative organisations of the profession and the industry."

Mr. W. E. Rice (Messrs. Rice and Son, Ltd.) was elected senior vice-president; Mr. H. C. Harland (Messrs. John Laing and Son, Ltd.), junior vice-president; and Mr. J. S. Galbraith (Messrs. Galbraith Bros., Ltd.) was elected hon. treasurer. Mr. John W. Marston (Messrs. W. J. Marston and Son) was elected hon. auditor.

The new members of the Council elected were Mr. R. R. Costain (Messrs. Richard Costain, Ltd.) and Mr. F. Leslie Whitehead (Messrs. L. and W. Whitehead, Ltd.).

A.R.P. SCHEMES

LONDON.

Coulsdon and Purley.—U.D.C. resolved that Sur. be instructed to submit report on cost of installation of lighting and heating apparatus in shelter at a day nursery.

Dagenham. — T.C. approved shelter for staff and public at Valence House, at £130.

East Ham.—E.C. propose to instal heating and lighting at school air raid shelters.

Epsom and Ewell.—Contracts placed with H. H. and F. Roll, Ltd., Cropley Bros., Uden and Co., all of Epsom, at £10,846, for public surface shelters to accommodate approx. 3,000 persons. Plans by Norman Auty, Boro' Eng.

Kensington.—B.C. recommend following architects for preparing plans for additional shelter accommodation: Sutton Dwelling Trust, Victor Wilkins, F.R.I.B.A., and Women's Pioneer Housing, Ltd., Miss Gertrude Leverkus, F.R.I.B.A.—Council providing protected sleeping accommodation, at £280 and £141, for stretcher-bearers at two depots.

Wood Green.—B.C. approved extension of R. and D. depot, at £290; protected accommodation at three ambulance and stretcher-party depots, at £1,080. Contracts placed with C. J. Pilgrim and Sons, at £180, for new control room at a fire station; Ernest Knifton, Ltd., for 29 communal shelters; Highworth Construction Co., Ltd., for conversion of depot, for R.R. and D. depot, and certain school, hall and house as wardens' posts, and W. R. Cruse, Ltd., for blast walls at a hall.—Boro' Eng. prepared plans for 50-person surface shelter, at £325.

PROVINCIAL.

Accrington.—T.C. to carry out A.R.P. work at grammar school, technical school and school of art. Plans by H. Sanderson, Boro' Sur.

Ashbourne.—Plans approved by U.D.C.: shelter to business premises, 9, Church-st., Boots Cash Chemists, Station-st., Nottingham.

Barnby Dun.—P.C. to erect communal surface shelters.

Barnsley.—E.C. to extend scheme for communal feeding centres. Plans by H. Taylor, Boro' Eng.

Bath. — School Managers, Southdown School, to obtain tenders for shelter.—Sur. of Corporate Property to prepare schemes for two shelters, each for 50 persons, at Twerton Playing Fields; shelter for 50 persons, at Cross Keys Playing Fields; shelter for 50 persons, at Kensington Meadows; and for strengthening rooms and basements in schools.

Burnley.—T.C. propose forming experimental community feeding and kitchen centres in six districts. Plans by J. L. Beckett, Boro' Eng.

Chapel-en-le-Frith.—R.D.C. to erect public shelters at Dove Holes and at Station-rd. Plans by T. Dimsdale, Sur.

Colwyn Bay.—T.C. propose public surface shelters. Plans by N. F. Jeffrey, Boro' Sur.

Denton.—U.D.C. to erect public shelter in basement of A.R.P. depot, Wilton-st. Plans by J. B. Cooke, Sur.

Doncaster.—Trustees of Methodist Church, Oxford-pl. (Rev. H. A. Swansborough, minister), accepted plans for three 50-person shelters.

Durham. — Contracts placed by R.D.C. with F. W. Goodyear, 60, Claypath, Durham, and D. Glen, Back Queen's-rd., Jarrow, for 46 brick surface communal shelters; adaptation of 183 houses, in Framwellgate Moor area. Sydney Dodds, Eng. and Sur., Byland Lodge, Hawthorn-ter. Quantities by M. C. Robson, L.R.I.B.A.

Hinckley.—U.D.C. approved plans for works shelters for Grewcock and Turner, Ltd., and for Harvey and Co., Ltd.

Hindley. — U.D.C. propose community feeding and kitchen centres. Plans by O. P. Abbott, Sur.

Lancashire.—E.C. to erect shelters at school clinics at four places. Plans by S. Wilkinson (F.), County Architect, Preston. Cost, £2,294.

Lancaster.—Regional Commissioner approved plans submitted by T.C. for 348 communal surface shelters and 157 adapted passages for 18,314 persons. Plans by F. Hill, City Sur.

Loughborough.—T.C. adopted scheme for communal shelters, at £90,000 to £100,000. Plans by W. Granger, Boro' Sur.

Manchester. — T.C. approved tubular heaters and lighting in shelters, at £377—Public Health Committee approved shelter accommodation for patients and staff, at hospital annexe, at £550.

Manchester.—T.C. approved proposals for conversion of two basements at a hospital annexe for use as air raid shelters.

Morecambe and Heysham.—T.C. to erect public surface shelters at Heysham. Plans by R. B. Savage, Boro' Sur.

Newcastle-under-Lyme. — T.C. propose adaptation of drill hall, Silverdale, for use as communal feeding and kitchen centre. Plans by A. Cotton, Boro' Sur.—Shelton Iron, Steel and Coal Co., Ltd., Silverdale, to erect A.F.S. depot and garage at Chesterton for T.C.—E.C. propose installing electric lighting in school shelters.—T.C. propose A.R.P. work at cemetery, etc., at £413.

Nidderdale.—R.D.C. to provide communal feeding and kitchen centres in parts of rural district.

North Worcestershire.—E.C. placed contract with Wm. Weaver, Ltd., The Strand, Bromsgrove, for raising baffle walls and covering entrances with reinforced concrete slabs at a junior school.

Nuneaton. — E.C. to erect additional shelters at schools and waterproofing 54 school shelters. Plans by R. C. Moon, Boro' Sur.

Oundle.—U.D.C. to erect 64 communal surface shelters for 1,200 persons. Plans by H. W. Bolton, Sur.

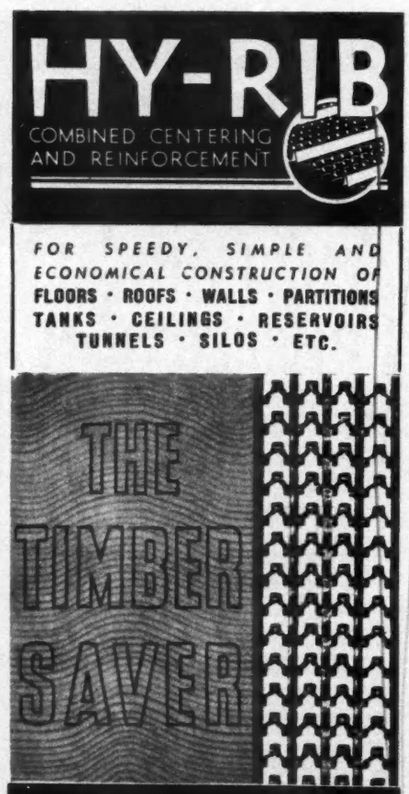
Rainford.—U.D.C. accepted tender of Foster Bros., Lords Fold, for installing seating accommodation in communal shelters. —U.D.C. propose waterproofing Anderson shelters and arched top communal shelters. Plans by R. C. Haycock, Sur.

Rotherham.—E.C. propose heating by electricity, school shelters, feeding centres and Whiston Open-air Schools. Plans by V. Turner, Boro' Eng.

Rothwell.—U.D.C. to adapt premises for community feeding and kitchen centre. Plans by F. Hartley, architect, Council Offices.

Scarborough.—E.C. to erect shelters at four schools.

Staveley.—U.D.C. to erect additional public shelters.—Premises to be converted for communal feeding and kitchen centre. Plans by E. G. Kington, architect (Houfton and Kington), Market-pl., Chesterfield.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Stoke-on-Trent.—T.C. accepted tenders for cleansing depots submitted by G. and J. Seddon, Ltd., Stoke-on-Trent, at £2,160, and Naylor and Nutt, Tunstall, at £1,769.

Stourbridge.—Board of Management of Hayley Green Hospital accepted tender of J. Taylor and Son, 38, Haygreen-la., Lye, for two shelters at hospital. Folkes and Folkes, architects, 38, Hagley-rd.—T.C. propose communal feeding and kitchen centres. Plans by G. N. Maynard, Boro' Sur.

Stretford.—T.C. approved £375 for shelter protection at Independent Methodist Chapel.

Sunderland.—D. and J. Ranken, Stockton-rd., secured contracts for shelters for Glaholm and Robson.

Sunderland. — E.C. approved £11,713 for heating and lighting in school shelters. Plans by O. H. Mark, Education Architect, Education Offices.

Tamworth.—T.C. to convert council school for communal feeding and kitchen centre. Plans by J. L. Bleazard, Boro' Sur.

Wallsend.—T.C. to set up number of communal feeding centres. Plans by J. A. Blench, Boro' Sur.—E.C. appointed Percy L. Browne, 16, Granville-ct., Jesmond, Newcastle, as architect for school shelters.

Walsall.—T.C. to provide additional shelter accommodation at 15 schools for 1,550, at £3,884. Plans by M. E. Habershon, Boro' Sur.

Whaley Bridge. — Z. and W. Wade, builders, Buxton-rd., secured contract for public shelters, for U.D.C. Plans by W. Butler, Sur.

Willington Quay-on-Tyne. — R. Burke, Singleton House, Northumberland-rd., Newcastle, architect for school shelters.

Worsley.—E.C. to adapt two rooms at school for feeding centre.

SCOTLAND.

Aberdeen.—Plans prepared for shelters. Plans by A. Gardner, City Architect.

Bishopbriggs.—Secretary of State approves cleansing station, at £1,800. Plans by W. Watts, architect, County Offices, Motherwell-Wishaw.

Dollar.—Plans prepared for shelters at public school. Andrew Malcolm, architect, 11, Spittal-st., Stirling.

Glasgow.—Plans prepared for shelters at library by T. Somers, architect, Municipal-chams.

Holytown.—Plans prepared for shelters at cemetery site. W. Watts, architect, Albert-st., Motherwell-Wishaw.

ADDITIONAL LABOUR POOL FOR ESSENTIAL SERVICES.

THE Ministry of Health has issued Circular 2285, informing local authorities that arrangements are being made in advance whereby temporary assistance may be afforded to local authorities and public utility undertakings by important firms who have organised in their factories groups of men who would be able and willing to lend a hand in the emergency repair of essential public services which suffer damage as a result of a heavy air attack. The Local Reconstruction Panels of the Ministry of Aircraft Production are in touch with all important concerns in their area, and the Panels (with the full support of the First Lord of the Admiralty, the Minister of Aircraft Production, the Minister of Supply, the Minister of Labour and the President of the Board of Trade) are inviting all important factories in industrial areas to enrol factory workers for this work, distinguishing between these in certain specified trades and those who may have no specialised skill but are handy with tools.

Lists of these "starred" factory workers will be kept by the firms employing them. The local office of the Ministry of Labour will keep a list of the firms employing "starred" men, showing the numbers of men in certain specified occupations and the numbers available for general repair work. In an emergency the public utility undertakings and the local authority will be able, through the local office of the Ministry of Labour, to call on these men for urgent repair work on houses, water and sewerage services with the consent of the employer.

The wages of men who may be lent by employers will be recoverable from the local authority or other undertaking requiring their services.

CONTRACTS OPEN

For some contracts still open, but not included in this list, see previous issues. Those with an asterisk are advertised in this number. The dates at the head of paragraphs are those for the submission of tenders: a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained.

BUILDING.

FEBRUARY 14.

Belper U.D.C. — Fixing of steelwork for strengthening seven existing concrete trench shelters. W. H. Wheeldon, Sur., Memorial-bldgs., King-st.

FEBRUARY 15.

Coleraine T.C. — Six surface shelters. Boro' Sur.

FEBRUARY 17.

Consett U.D.C.—Two public air raid shelters (50 persons) at Leadgate; lining in concrete of approx. 400 Anderson steel shelters; lining in precast slabs of approx. 100 Anderson steel shelters. T. P. Leath, Property Sur.

Dundee T.C.—A.R.P. protection work. City Quantity Sur., 21, City-sq.

Hull T.C.—Heating and hot-water installation for A.F.S. station. City Architect. Dep. £1 1s.

Norwich T.C.—Surface shelters. City Eng.

Orrell U.D.C.—Communal shelters. Sur.

Penmaenmawr U.D.C. — Three public shelters. Sur.

Plymouth T.C.—Kitchen waste concentrator house. J. Paton Watson, City Eng. and Sur.

St. Albans R.D.C.—Fire station. Eng. and Sur., 43, Upper Lattimore-rd. Dep. £2 2s.

Weston-super-Mare T.C.—Pumping station at Uphill Way, near junction with Uphill-rd. H. A. Brown, Boro' Eng. and Sur. Dep. £1 1s.

Whitby U.D.C.—25 surface shelters of the 48-person type. Eng. and Sur. Dep. £1 1s.

Worksop T.C.—Approx. 500 reinforced brick and concrete domestic surface shelters. Boro' Eng., Park House. Dep. £2 2s.

FEBRUARY 18.

Dublin Corporation. — 16 flat dwellings and reconstruction of premises at Cook-st. housing area, section No. 3. H. G. Simms, Housing Architect, 5, Wellington-quay. Dep. £5 5s.

Higham Ferrers T.C.—Five domestic shelters and 1,000 yds. of baffle wall. A. E. Lloyd, Boro' Sur.

FEBRUARY 19.

Dunfermline T.C.—Workshop buildings, etc. J. W. Anderson, Burgh Sur., 8, New-row.

Tuam. — New national schools, for Christian Brothers. F. D. Shortall, F.S.I., chartered quantity surveyor, 10, Leinster-st., Dublin, C.17. Dep. £5 5s.

FEBRUARY 20.

Monmouthshire C.C.—Alterations, painting, etc., at Regent's House, Chepstow. Colin L. Jones (F.), Queen's Hill, Newport. Dep. £2 2s

FEBRUARY 21.

Gravesend T.C.—Approx. 31½ tons of steelwork for strengthening of precast concrete-lined trenches. Boro' Eng., 6, Woodville-ter.

Tullamore U.D.C. — 82 four-roomed two-storey houses at Clontarf-rd. T. S. Duggan, Town Sur. Dep. £5 5s.

Tyldesley U.D.C.—Strengthening of basement shelters. Sur.

Worksop R.D.C.—Communal domestic surface shelters. W. Flint, Sur., 222, Carlton-rd.

FEBRUARY 22.

Staffs C.C.—330 yds. of wall at Beamhill. County Sur., Stafford.

NO DATE.

Great Harwood U.D.C.—Air raid shelters. J. N. Bell, Sur.

Malden and Coombe T.C.—Lecture room, sleeping accommodation and lavatories at first-aid post. Boro' Eng.

Stepney B.C.—Demolition for clearance of sites in borough. W. Eric Adams, A.R.P. Controller, Control Centre, London, E.1.

PAINTING, ELECTRIC LIGHTING, HEATING, &c.

FEBRUARY 18.

Rochester.—Painting bridge. P. T. Baker, Bridge Clerk, 18, Star Hill.

FEBRUARY 24.

Cookham R.D.C. — Painting, decorating and repairs at Sleckstone and Woodland cottages, Cookham Rise. Sur.

MATERIALS.

The materials for which tenders are invited normally include one or several of the following:—asphalt, bricks brooms, building lime, cast-iron pipes, cement, stoneware pipes, granite chippings, granite kerbs, gravel, gulleys, lime, manhole covers, painters' materials, plumbers' materials, road stone, slates, sand, stone, tar, tarslag and bituminous macadam, timber, and whinstone screenings Readers should obtain full particulars by personal inquiry.

FEBRUARY 15.

Croydon T.C.—Boro' Eng.

Fife C.C.—J. M. Mitchell, County Clerk, Fife.

Newburn U.D.C.—Sur.

Pembrokeshire C.C.—County Sur., Haverfordwest.

Wardle U.D.C.—Sur.

FEBRUARY 17.

Blyth T.C.—Boro' Eng.

Chertsey U.D.C.—W. V. Davies, Eng. and Sur.

Selby R.D.C. — F. Braithwaite, Sur., 22, Park-st.

Swinton and Pendlebury T.C.—Boro' Eng. and Sur.

West Lancashire R.D.C.—R. Rosbotham, Sur.

FEBRUARY 18.

Enfield U.D.C.—Eng. and Sur., 7, Little Park-gdns.

FEBRUARY 19.

Colne T.C.—Boro' Eng. and Sur.

Felixstowe U.D.C.—A. Hugh Pavitt, Sur.

Garstang R.D.C.—W. M. Kelly, Sur.

Plymouth T.C.—C. Campbell, Town Clerk.

Wandsworth B.C. — R. H. Jerman, Town Clerk.

FEBRUARY 20.

Derby T.C.—E. H. Bennett, Boro' Eng., 15, Tenant-st.

Frimley and Camberley U.D.C.—Eng. and Sur.

FEBRUARY 21.

East Riding C.C.—County Sur., Beverley.

Halifax C.B. — D. T. Lloyd Jones, Boro' Eng., Crossley-st.

Heston and Isleworth T.C.—O. P. F. Hilton, Boro' Eng.

FEBRUARY 22.

Ashford (Kent) U.D.C.—Sur., 5, North-st.

Atherton U.D.C.—Sur.

Caernarvonshire C.C.—County Sur., Caernarvon.

Garforth U.D.C.—B. J. Cornelius, Eng. and Sur.

Heywood T.C.—A. Middleton, Boro' Sur.

Neath T.C.—E. J. Rees, Boro' Eng.

Turton U.D.C.—R. Dart, Eng. and Sur.

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FEBRUARY 24.

Bacup T.C.—H. Guffogg, Boro' Eng.

Denbighshire C.C.—E. A. Evans, County Surveyor, 46, Clwyd-st., Ruthin.

Tees Valley Water Board.—E. A. Morris, Clerk, Water Board Offices, Middlesbrough.

FEBRUARY 25.

Osgoldcross R.D.C.—Jas. E. White, Eng. and Sur., Tanshelf House, Pontefract.

FEBRUARY 28.

Blackburn R.D.C.—Eng. and Sur., 42, Wellington-st.

Bolsover U.D.C.—W. Veevers, Clerk.

Lindsey C.C. — A. G. Bradshaw, County Sur., Lincoln.

MARCH 1.

Salop C.C.—County Sur., Shrewsbury.

Willenhall U.D.C. — N. D. Martin, M.Inst.M. and Cy.E.

MARCH 3.

Shrewsbury T.C.—A. W. Ward, Boro' Sur.

ENGINEERING, IRON AND STEEL.

MARCH 3.

Ballymena T.C. — Impounding reservoir. John Taylor and Sons, engineers, Caxton House, Westminster, London, S.W.1. Dep. £5.

MARCH 17.

South Africa.—Stoker fired boilers complete with auxiliaries; also steel frame buildings for boiler and turbine houses for Pretoria City Council. Merz and McLellan, consulting engineers, 32, Victoria-st., London, S.W.1. Dep. £2 2s.

ROAD, SEWERAGE AND WATER WORKS.

FEBRUARY 14.

Boston T.C.—Supply and laying of 3,600 yds. super of single-coat asphalt. Boro' Sur.

FEBRUARY 15.

Guildford T.C.—Laying of 253 yds. of 6-in. dia. soil sewer, provision of w.c.s, and connection of 12 houses to new sewer, with manholes, etc. Boro' Sur.

Westmorland C.C.—Spraying with tar and bitumen 1,500,000 sq. yds. of county roads, and 500,000 gallons of refined tars, tar compounds, bitumens and bituminous emulsions. H. B. Greenwood, Clerk, County Hall, Kendal.

FEBRUARY 17.

Plymouth T.C. Road improvement at Crownhill. J. Paton Watson, City Eng.

FEBRUARY 19.

Liverpool T.C.—Back street sewers, pavings, etc., to flats, Blucher-st. City Architect and Director of Housing, Blackburn-chams., Dale-st., Kingsway. Dep. £1 1s.

FEBRUARY 22.

Warwick R.D.C.—Provision and laying of 1,873 yds. of 4-in. dia. spun-iron pipes, together with ancilary works. Sur., Waterloo-pl., Leamington Spa.

NON-STOP BUILDING

LEADING Government building contractors are introducing to contracts for which they are responsible a new technique in winter-time building which is defying the limitations normally imposed by the black-out and weather conditions. Part of the construction programme on which these contractors are engaged includes sites where urgent building work is being carried out throughout the winter months.

Black-out and adverse weather conditions are not allowed to cause stoppage on these sites. Large canvas screens protect the workmen from cold winds, retain the heat in the building, and enable construction to be carried on right through the hours of darkness. Hot-water pipes are laid throughout the building to keep the atmosphere warm and help the rapid hardening of the concrete as it is placed. Boiling steam jets are played on the aggregate to keep out the frost, while the water is heated to maintain it at the correct temperature for concreting.

This building technique, which is new on this side of the Atlantic, is eliminating stoppages due to bad weather and enabling a 24-hour day to be worked. This will result in a considerable speed-up of construction, so that new buildings essential to the war effort can be occupied in the minimum of time.

RATES OF WAGES IN THE BUILDING TRADE

AS AND FROM 1st FEBRUARY, 1941

[Every endeavour is made to ensure accuracy, but we cannot be responsible for errors]

	Crafts-men.	Lab-ourers.		Crafts-men.	Lab-ourers.		Crafts-men.	Lab-ourers.		Crafts-men.	Lab-ourers.
Aberavon	1/10	1/5½	Clitheroe	1/10	1/5½	Isle of Thanet	1/8	1/3½	Saxmundham	1/6½	1/2
Aberdare	1/10	1/5½	Cobham (Surrey)	1/9	1/4½	Isle of Wight	1/7½	1/3½	Scarborough	1/9½	1/4½
Abergavenny	1/10	1/5½	Colchester	1/9½	1/4½	Keighley	1/10	1/5½	Scunthorpe	1/10	1/5½
Abingdon	1/8½	1/4	Colwyn Bay	1/9	1/4½	Kenilworth	1/10	1/5½	Selby	1/10	1/5½
Accrington	1/10	1/5½	Congleton	1/9½	1/4½	Kettering	1/10	1/5½	Sevenoaks	1/8½	1/4
Aldeburgh	1/6½	1/2½	Coventry	1/10	1/5½	Kidderminster	1/9½	1/4½	Sheerness	1/8	1/3½
Aldershot	1/8½	1/4	Cranbrook	1/8	1/3½	King's Lynn	1/8	1/3½	Sheffield	1/10	1/5½
Alfreton	1/10	1/5½	Cranleigh	1/8	1/3½	Kirkham	1/10	1/5½	Shipley	1/10	1/5½
Alnwick	1/9½	1/4½	Crawley	1/8	1/3½	Knowle	1/9½	1/4½	Shoeburyness	1/9½	1/4½
Altrincham	1/10	1/5½	Crewe	1/9½	1/4½	Lancaster	1/10	1/5½	Shoreham	1/9	1/4½
Amble	1/9½	1/4½	Cromer	1/7	1/3	Leamington	1/10	1/5½	Shrewsbury	1/9½	1/4½
Amersham	1/8½	1/4	Crowborough	1/8	1/3½	Leatherhead	1/9	1/4½	Sittingbourne	1/8	1/3½
Ammanford	1/10	1/5½	Cuckfield	1/8	1/3½	Leeds	1/10	1/5½	Skegness	1/9	1/4½
Andover	1/8	1/3½	Darlington	1/10	1/5½	Leicester	1/10	1/5½	Sleaford	1/8½	1/4
Ardingley	1/8	1/3½	Darwen	1/10	1/5½	Leighton Buzzard	1/7	1/3	Slough	1/9	1/4½
Arundel	1/8	1/3½	Daventry	1/8½	1/4	Letchworth	1/9	1/4½	Southampton	1/9½	1/4½
Ascot	1/8	1/3½	Deal	1/8	1/3½	Lewes	1/8	1/3½	Southend-on-Sea	1/9½	1/4½
Ashby-de-la-Zouch	1/10	1/5½	Denbigh	1/9	1/4½	Lichfield	1/9	1/4½	Southport	1/10	1/5½
Ashford (Kent)	1/8	1/3½	Derby	1/10	1/5½	Lincoln	1/10	1/5½	South Shields	1/10	1/5½
Ashford (Middlesex)	1/10	1/5½	Devizes	1/7	1/3	Littlehampton	1/8	1/3½	Spalding	1/8	1/3½
Ashington	1/9½	1/4½	Dewsbury	1/10	1/5½	Liverpool	‡§1/11½	¶	Stafford	1/9½	1/4½
Ashtead	1/10	1/5½	Didcot	1/8	1/3½	Llandudno	1/9	1/4½	Staines	1/9	1/4½
Ashton-under-Lyme	1/10	1/5½	Diss	1/6½	1/2½	Llanelly	1/10	1/5½	Stamford	1/9	1/4½
Aylesbury	1/8	1/3½	Doncaster	1/10	1/5½	London—			Stevenage	1/9	1/4½
Aylsham	1/7	1/3	Dorchester	1/7½	1/3½	12m. radius	•1/11½	1/6½	Stockport	1/10	1/5½
Bagshot	1/8	1/3½	Dorking	1/8½	1/4	12-15 m. radius	•1/11	1/6	Stockton-on-Tees	1/10	1/5½
Banbury	1/8	1/3½	Dover	1/8	1/3½	Long Eaton	1/10	1/5½	Stoke-on-Trent	1/10	1/5½
Barnsley	1/10	1/5½	Dovercourt	1/8	1/3½	Longton	1/10	1/5½	Stourbridge	1/10	1/5½
Barnstaple	1/8	1/3½	Driffield	1/8½	1/4	Loughborough	1/10	1/5½	Stourport	1/9½	1/4½
Barrow-in-Furness	1/10	1/5½	Droitwich	1/9½	1/4½	Louth	1/8½	1/4	Stowmarket	1/7	1/3
Barry	1/10	1/5½	Dudley	1/10	1/5½	Lowestoft	1/8	1/3½	Stratford-on-Avon	1/9	1/4½
Basingstoke	1/8	1/3½	Dunstable	1/8½	1/4	Luton	1/9½	1/4½	Stroud	1/9	1/4½
Bath	1/9½	1/4½	Durham City	1/10	1/5½	Macclesfield	1/9½	1/4½	Sunderland	1/10	1/5½
Batley	1/10	1/5½	Eastbourne	1/9	1/4½	Maidenhead	1/9	1/4½	Sutton Coldfield	1/10	1/5½
Beaconsfield	1/8½	1/4	E. Glam. (Mon. Val.)	1/10	1/5½	Maidstone	1/8½	1/4	Swaffham	1/6½	1/2½
Beccles	1/6½	1/2½	East Grinstead	1/8	1/3½	Malvern	1/8½	1/4	Swanage	1/8	1/3½
Bedford	1/9½	1/4½	Edenbridge	1/8	1/3½	Manchester	1/10	1/5½	Swansea	1/10	1/5½
Berkhamsted	1/8	1/3½	Ely	1/7	1/3	Manningtree	1/7	1/3	Swindon	1/8½	1/4
Berwick	1/9½	1/4½	Epping	1/10	1/5½	Mansfield	1/10	1/5½	Tamworth	1/9½	1/4½
Beverley	1/10	1/5½	Exeter	1/9½	1/4½	March	1/7	1/3	Taunton	1/8½	1/4
Bexhill-on-Sea	1/8½	1/4	Exmouth	1/8½	1/4	Margate	1/8	1/3½	Tenterden	1/8	1/3½
Bideford	1/8	1/3½	Fakenham	1/7	1/3	Market Harborough	1/9	1/4½	Thames Haven	1/10	1/5½
Biggleswade	1/8	1/3½	Falmouth	1/8½	1/4	Matlock	1/8½	1/4	Thetford	1/7½	1/3½
Billericay	1/7½	1/3½	Fareham	1/9	1/4½	Melton Constable	1/6½	1/2½	Thorpe Bay	1/9½	1/4½
Birchington	1/8	1/3½	Faversham	1/8	1/3½	Melton Mowbray	1/9	1/4½	Todmorden	1/10	1/5½
Birkenhead	‡§1/11½	¶	Felixstowe	1/9	1/4½	Merthyr	1/10	1/5½	Tonbridge	1/8½	1/4
Birmingham	†1/10	†1/5½	Filey	1/8½	1/4	Middlesbrough	1/10	1/5½	Torquay	1/9½	1/4½
Bishop Auckland	1/10	1/5½	Fleetwood	1/10	1/5½	Middleton	1/10	1/5½	Totnes	1/8	1/3½
Bishops Stortford	1/9	1/4½	Flint	1/10	1/5½	Middlewich	1/9½	1/4½	Trowbridge	1/7	1/3
Blackburn	1/10	1/5½	Folkestone	1/8	1/3½	Milford Haven	1/8½	1/4	Truro	1/7½	1/3½
Blackpool	1/10	1/5½	Frinton-on-Sea	1/8	1/3½	Morecambe	1/10	1/5½	Tunbridge Wells	1/8½	1/4
Blyth	1/10	1/5½	Frome	1/7	1/3	Morley	1/10	1/5½	Uppingham	1/8½	1/4
Bognor Regis	1/8	1/3½	Gainsborough	1/9	1/4½	Mundesley	1/7	1/3	Uttoxeter	1/8½	1/4
Bolton	1/10	1/5½	Gateshead	1/10	1/5½	Nantwich	1/9½	1/4½	Wakefield	1/10	1/5½
Bournemouth	1/9	1/4½	Gillingham (Kent)	1/9	1/4½	Nelson	1/10	1/5½	Walsall	1/10	1/5½
Bracknell	1/8	1/3½	Glossop	1/10	1/5½	Newark-on-Trent	1/9½	1/4½	Walsden	1/10	1/5½
Bradford	1/10	1/5½	Gloucester	1/9½	1/4½	Newbury	1/8	1/3½	Walton-on-Naze	1/8	1/3½
Bradford-on-Avon	1/7	1/3	Godalming	1/8	1/3½	Newcastle-on-Tyne	1/10	1/5½	Ware	1/9½	1/4½
Braintree	1/8	1/3½	Goole	1/10	1/5½	Newcastle-u.-Lyme	1/10	1/5½	Warminster	1/7	1/3
Brentwood	1/9½	1/4½	Gosport	1/9½	1/4½	New Forest	1/8	1/3½	Warrington	1/10	1/5½
Bridgwater	1/8½	1/4	Grantham	1/9	1/4½	Newmarket	1/8	1/3½	Warwick	1/10	1/5½
Bridlington	1/9½	1/4½	Gravesend	1/9½	1/4½	Newport, Mon.	1/10	1/5½	Wellingborough	1/9½	1/4½
Brighouse	1/10	1/5½	Great Yarmouth	1/8	1/3½	Newport Pagnell	1/8	1/3½	Welwyn	1/9	1/4½
Brighton	1/9	1/4½	Grimsby	1/10	1/5½	Northampton	1/10	1/5½	Welwyn Gar. City	1/10	1/5½
Bristol	1/10	1/5½	Guildford	1/8	1/3½	Norwich	1/10	1/5½	Wells (Norfolk)	1/6½	1/2½
Broadstairs	1/8	1/3½	Guilsborough	1/8½	1/4	Nottingham	1/10	1/5½	West Bromwich	1/10	1/5½
Bromsgrove	1/9½	1/4½	Halifax	1/10	1/5½	Nuneaton	1/10	1/5½	Westcliff-on-Sea	1/9½	1/4½
Buckley	1/10	1/5½	Hanley	1/10	1/5½	Oakham	1/8½	1/4	Weston-super-Mare	1/9	1/4½
Bungay	1/6	1/2½	Harpenden	1/9	1/4½	Oldham	1/10	1/5½	Weybridge	1/9	1/4½
Burnham-on-Crouch	1/6½	1/2½	Harrogate	1/10	1/5½	Ormskirk	1/10	1/5½	Weymouth	1/8	1/3½
Burnley	1/10	1/5½	Hartlepools	1/10	1/5½	Oxford	1/9½	1/4½	Whitby	1/9	1/4½
Burslem	1/10	1/5½	Harwich	1/8	1/3½	Oxted	1/8½	1/4	Whitstable	1/8	1/3½
Burton-on-Trent	1/10	1/5½	Haslemere	1/8	1/3½	Paignton	1/9½	1/4½	Widnes	1/10	1/5½
Bury	1/10	1/5½	Hastings	1/8	1/3½	Peterborough	1/9½	1/4½	Wigan	1/10	1/5½
Bury St. Edmunds	1/7½	1/3½	Hatfield	1/9½	1/4½	Plymouth	1/10	1/5½	Wigton	1/8½	1/4
Buxton	1/9½	1/4½	Haywards Heath	1/8	1/3½	Pontefract	1/10	1/5½	Willington	1/10	1/5½
Byfleet	1/8½	1/4	Hednesford	1/9½	1/4½	Pontypridd	1/10	1/5½	Wilmslow	1/10	1/5½
Cambridge	1/10	1/5½	Hemel Hempstead	1/9	1/4½	Port Talbot	1/10	1/5½	Winchester	1/8½	1/4
Canterbury	1/8	1/3½	Henley-on-Thames	1/8	1/3½	Portsmouth	1/9½	1/4½	Windermere	1/8½	1/4
Cardiff	1/10	1/5½	Hereford	1/8	1/3½	Preston	1/10	1/5½	Windsor	1/9	1/4½
Carlisle	1/10	1/5½	Herne Bay	1/8	1/3½	Pulborough	1/8	1/3½	Wisbech	1/7½	1/3½
Carnforth	1/10	1/5½	Hertford	1/9½	1/4½	Ramsgate	1/8	1/3½	Witham	1/8	1/3½
Castleford	1/10	1/5½	Heysham	1/10	1/5½	Reading	1/9½	1/4½	Woking	1/8½	1/4
Caterham	1/10	1/5½	Hitchin	1/9	1/4½	Redditch	1/9½	1/4½	Wokingham	1/8	1/3½
Chard	1/7	1/3	Hoddesdon	1/9½	1/4½	Redhill	1/8½	1/4	Wolverhampton	1/10	1/5½
Chatham	1/9	1/4½	Holt (Norfolk)	1/6½	1/2½	Ripon	1/8½	1/4	Woodbridge	1/7½	1/3½
Chelmsford	1/9½	1/4½	Horley	1/8	1/3½	Rochdale	1/10	1/5½	Worcester	1/9½	1/4½
Cheltenham	1/9	1/4½	Horsham	1/8	1/3½	Rochester	1/9	1/4½	Workington	1/8½	1/4
Chepstow	1/9½	1/4½	Horwich	1/10	1/5½	Rugby	1/10	1/5½	Worksop	1/9½	1/4½
Chertsey	1/9	1/4½	Huddersfield	1/10	1/5½	St. Albans	1/9½	1/4½	Worthing	1/8	1/3½
Chesterfield	1/10	1/5½	Hull	1/10	1/5½	St. Helens	1/10	1/5½	Wrexham	1/9½	1/4½
Chichester	1/8	1/3½	Hunstanton	1/7	1/3	St. Neots	1/7½	1/3½	Wroxham	1/7½	1/3½
Chorley	1/10	1/5½	Huntingdon	1/7½	1/3½	Saffron Walden	1/7	1/3	Wycombe	1/9	1/4½
Cirencester	1/7½	1/3½	Ilfracombe	1/8	1/3½	Salisbury City	1/7½	1/3½	Wymondham	1/7	1/3
Clacton	1/8	1/3½	Ingatestone	1/8½	1/4	Salisbury Plain	1/9	1/4½	Yeovil	1/8½	1/4
Cleveleys	1/10	1/5½	Ipswich	1/9½	1/4½	Sawbridgeworth	1/8½	1/4	York	1/10	1/5½

• Painters 1d. less than other Craftsmen. † Plus 2d. per working day. ‡ Plasterers 2/-

¶ Tradesman's Labourers, 1/5½. Navvies and General Labourers 1/5½.

§ Joiners, Plumbers, Bricklayers, Tilers and Masons receive 2/- per week or 4d. per day Tool Money.

NOTE: Carpenters and Joiners in all Towns and Districts (other than Birkenhead and Liverpool) receive 2d per day Tool Allowance

For Building Trade Wages in Scotland, see page 190.

PRICES CURRENT OF MATERIALS*

Note: Owing to the exceptional circumstances which prevail at the present time prices of materials should be confirmed by inquiry. The prices of soft woods are for cash on delivery, and are subject to adjustment when the increased price of £22 per standard for national released stocks is finally fixed.

At present linseed oil and genuine spirits of turpentine can only be supplied in cans in small quantities.

BRICKS, &c.

The price for Stock Bricks has been altered to minimum price at works for full lorry loads. A quotation for cartage should be obtained as the haulage question difficult.

		£ s. d.
First Hard Stocks	per 1,000	£4 5 6
Second Hard Stocks	„	3 18 6
Mild Stocks	„	3 5 6
Single Rough Stocks	„	2 19 6
Third Common Stocks	„	2 10 0

2¾ in. Phorpres. A discount of 6d. 1,000 only monthly account.	King's Cross Station per 1,000. s. d.	To sites in W.C. District. per1,000 s. d.
Pressed	51 9	58 3
Keyed	53 9	60 3
Single Bullnose	71 9	78 3
Rustics	71 9	78 3
Whites	72 3	78 3

	£ s. d.
White Midhurst Facing Bricks (delivered London site)	3 12 6
Best blue Pressed Staffs. (London Stns.)	10 2 0
Do. Bullnose (London Stns.)	10 12 0
Blue Wire Cuts (London Stns.)	8 19 6

Best Stourbridge Fire Brick (London Stns.):—
2½ in. 0 3 6 3 in. 11 1 0

GLAZED BRICKS. (London Stns.)

Best White Ivory and Salt Glazed Stretcher	28 0 0	D'ble Str'tch'rs	36 10 0
		D'ble Headers	33 10 0
Headers	27 10 0	One sided&two ends	37 10 0
Quoins, Bullnose and 4½ in. Flats	34 10 0	Two sidesdone end Splays and Squints	38 10 0
			36 0 0

Second Quality, £2 per 1,000 less than best. Cream and buff, £2 extra over white. Other colours. Hard Glaze, £5 10s. extra over white.

PARTITION SLABS.

Delivered London Area.

"PHORPRES" HOLLOW PARTITION BLOCKS.

2" per yd. sup.	2 3	3" per yd. sup.	2 9
2½ „ „	2 6	4" „ „	3 1

CLINKER CONCRETE.

2" per yd. sup.	1 6	3" per yd. sup.	2 0
2½ „ „	1 8	4" „ „	2 4

CRANHAM TERRA COTTA.

2" per yd. sup.	3 0	3" per yd. sup.	3 8
2½ „ „	3 6	4" „ „	4 7

HEMPSTEAD—KEYED TWO SIDES.

12" x 9" x 2"	2 6	12" x 9" x 3"	3 0
12" x 9" x 2½"	2 9	12" x 9" x 4"	3 9

Per yard super d/d. Free on site, London.

SAND.

Thames Ballast	8	6 per yd.	delivered 2 miles radius Paddington.
Pit Ballast	8	6 „ „	
Pit Sand	10	0 „ „	
Washed Sand	13	0 „ „	
¾ in. Shingle	8	0 „ „	
¾ in. Broken Brick	12	6 „ „	
Pan Breeze	8	3 „ „	

CEMENT.

Best British Portland Cement. Standard Specification. delivered London Area.

	£ s. d.
4 ton loads and upwards site. Per ton	2 9 6
1 ton to 4 tons site	2 12 6
Alongside Vauxhall in 80 ton lots	2 7 0
"Ferrocrete" Rapid Hardening Cement—	
4 ton loads and upwards site	2 15 6
1 ton to 4 tons site	2 18 6
Alongside Vauxhall in 80 ton lots	2 13 0

Stored in Reserved Bins at works. 1/6 per ton extra.

"Aquacrete" Water Repellent, "Blue Circle" cement, 30/- per ton extra on ordinary "Blue Circle" prices.

"Colorcrete" Nos. 1 and 2. Coloured Rapid Hardening Portland Cement	3 19 6
"Colorcrete" not rapid hardening, according to colour, from £7 to £15 10s. per ton.	
"Snowcrete" White Portland Cement	9 5 0
Super Cement (Waterproof), *bags extra*	3 19 6

NOTE.—Paper bags will be charged at the rate of 6/- nett per ton. Jute sacks charged 1s. 9d. nett each and 1/6 nett each allowed if returned to works within two weeks, in good condition.

Carriage will be paid by makers on returned empty jute sacks.

Roman Cement £7 5 Keene's Cement, White £6 10 0
Parian Cement 6 10 „ „ Pink 6 5 0
Cementone Colours for cement according to tints per cwt. from £2 16s. 0d.

PLASTER.

	£ s. d.		£ s. d.
Coarse, Pink	3 12 6	Sirapite, Coarse	4 3 0
„ White	4 0 0	„ Finish	4 11 0
Pioneer	4 3 0		

Above prices for 4-ton loads and over London Area.

Best Ground Blue Lias Lime	3 0 0	Grey Stone Lime	2 15 0
		Chalk Lime	2 15 0
Granite Chippings	1 10 0	Hair per cwt.	2 7 6

NOTE.—Sacks are charged 1s. 9d. each, and credited 1s. 6d., if returned in good condition within three months, carriage paid.

Stourbridge Fireclay in paper bags, £2 12 6 in 6-ton lots at railway depot.

STONE.

	s. d.
BATH STONE.—Delivered in railway trucks at Westbourne Park, Paddington, G.W.R., or South Lambeth, G.W.R., per ft. cube	3 3½
BEER STONE—RANDOM BLOCK— Free on rail at Seaton Station. per ft. cube	2 3
Delivered free on rail Nine Elms, S.R. „	3 1½
Selected approximate size one way, 1d. per cubic ft. extra, selected approximately three sizes or for special work, 3d. per cubic ft. extra.	

PORTLAND STONE—

	s. d.
Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Nine Elms, S. Rly., South Lambeth Station, G.W.R., and Westbourne Park, Paddington, G.W.R., per ft. cube	4 7
Do. do. delivered on road waggons as above stations, per ft. cube	4 7

White basebed, 3d. per ft. cube extra.

NOTE.—1d. per ft. cube extra for every ft. over 20 ft. *average* and ½d. beyond 30 ft.

HOPTON-WOOD STONE—

		s. d.
F.O.R. Quarries, Wirksworth, Derbyshire, Random blocks from 10 ft. and over	P.ft.cb.	14 0
Sawn two sides		22 6

HOPTON-WOOD STONE—

Sawn three or four sides		27 0

YORK STONE, BLUE—*Robin Hood Quality.*
Delivered at any Goods Station, London.

6 in. sawn two sides landings to sizes (under 30 ft. super)	per ft.super	5 6
6 in. rubbed two sides, ditto	„	6 3
3 in. sawn two sides slabs (random sizes)	„	2 7
2 in. to 2½ in. sawn one side slabs (random sizes) (paving)	„	1 8½
1½ in. to 2 in. ditto	„	1 4½

HARD YORK—
Delivered at any Goods Station, London.

Scrappied random blocks	per ft.cube	6 10
6 in. sawn two sides landings to sizes (under 40 ft. super)	per ft.super	5 7½
6 in. rubbed two sides, ditto	„	6 9
4 in. sawn two sides slabs (random sizes)	„	3 5
3 in. ditto ditto	„	2 8
2 in. self-faced random flags	per yd.super	8 9

CAST STONE.

Delivered in London area in full van loads, per ft. cube: Plain, 7s. 6d. Moulded, 8s. 6d. Sills, 10s. 0d.

HARD WOOD.

1 INCH AND UP THICK.

	£ s. d.
Average price for prime quality.	
Dry Austrian Wainscot, per ft. cube	0 17 0
Dry American and/or Japanese Figured Oak, per ft. cube 10 6 to	0 13 0
Dry American and/or Japanese plain Oak, per ft. cube	0 11 6
Dry sq. edged Honduras Mahogany, per ft. cube	0 15 0
Dry log-cut Honduras Mahogany, per ft. cube 12 6 to	0 16 0
Dry Cuba Mahogany, per ft. cube	0 18 0
Dry Teak, per ft. cube	0 14 0
Dry American Whitewood, per ft. cube	0 10 6
Dry Australian Walnut, per ft. cube	0 19 0
Dry Queensland Silky Oak, per ft. cube	0 12 6
Dry African Mahogany, per ft. cube	0 10 0
Dry African Whitewood, per ft. cube	0 8 0
Dry English Wainscot Oak, per ft. cube	0 16 0
Best Scotch Glue, per cwt.	3 0 0
Liquid Glue, per cwt. 4 7 0 to	5 10 0

SOFT WOOD.

MERCHANTABLE BRITISH COLUMBIAN PINE.

	Minimum. £ s. d.	Maximum. £ s. d.
Scantlings in imported sizes, 2 in. by 3 in. to 4 in. by 11 in.	43 10 0	53 0 0

Having Secured the Contract— What about the Steel Scaffolding?

TUBULAR

—S & C—

SCAFFOLDING

For the lowest Prices apply to the Oldest Firm in the Scaffolding Trade.

STEPHENS & CARTER LTD.

The British Steel Scaffolding Co.

731-761, HARROW RD., N.W.10.

Telephone No. Ladbroke 1191 (6 lines).

PLANED BOARDS.
PRIME CLEAR BRITISH COLUMBIAN PINE.

	Per standard. £ s. d.
1 in. by 11 in. } 1 in. by 9 in. }	67 10 0

	Per square. s. d.
1 in. plain edge flooring	53 0
1¼ in. ditto	66 6
1 in. tongued and grooved	53 0
1¼ in. ditto	66 6

MATCHING.

	Per square. s. d.
¾ in.	37 6
¾ in.	42 0
1 in.	55 0

SLATES.

First quality slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate Station. Per 1,000 actual.

	£ s. d.		£ s. d.
24 by 12	30 7 6	18 by 10	21 15 0
22 by 12	33 0 0	18 by 9	20 0 0
22 by 11	30 5 0	16 by 10	19 0 0
20 by 12	29 10 0	16 by 8	15 5 0
20 by 10	27 2 6		

TILES.

Delivered at London rate stations in full truck loads of not less than 6 tons. Per 1,000 f.o.r. London

Best machine-made tiles from Broseley or Staffordshire district	£5 10 0
Ditto hand-made ditto	6 10 0
Ornamental ditto	6 15 0
Hip and valley tiles (per dozen) Hand-made	0 11 6
Machine-made	0 11 0

METALS.

JOISTS, GIRDERS, &c., TO LONDON STATION PER TON— R.S. Joists, cut and fitted	£22 10 0
Plain Compound Girders	25 0 0
Stanchions	27 10 0
In "Roof Work"	32 10 0

NOTE.—These prices are for standard pieces and not special pieces of an awkward nature.

MILD STEEL ROUNDS.—To London Stations, per ton.

Diameter.	£ s. d.	Diameter.	£ s. d.
¼ in.	22 5 0	⅜ in. to ½ in.	20 15 0
⅝ in.	21 5 0	⅝ in. to 2½ in.	20 5 0

WROUGHT TUBES AND FITTINGS.
Deliveries from works.
Deliveries from London stock further 2½% gross.
Fittings.

	Tubes. ½"/6" %	Tubulars. ½"/6" %	10/17 19/24 %	Flanges. ½"/2" %	2½"/6" %
Light weight	55½	—	48	51½	58
Heavy weight	48½	48½	40½	41½	50½
Galv.lightweight	44½	—	39½	40½	49½
Galv.heavyweight	35½	35½	31½	30½	41½

Tubes and tubulars sizes ½"/1" inclusive, charged extra of 5% less gross.
Fittings. Figs. 25/34 5% less gross discount.
Terms.—Nett cash end of month following date of invoice. Carriage paid on lots of £10 nett value and over.

C.I. HALF-ROUND GUTTERS—London Prices ex Works. per yd. in 6 ft. lengths.

	Gutters.	Nozzles.	Stop ends.
3 in.	1/4½	1/1	4d.
3½ in.	1/5½	1/2½	4d.
4 in.	1/5½	1/4½	6½d.
4½ in.	1/6½	1/8	7½d.
5 in.	1/10½	1/11½	8d.

O.G. GUTTERS.

3 in.	1/9	1/5½	4½d.
3½ in.	1/11½	1/5½	6d.
4 in.	1/11½	1/6½	7d.
4½ in.	2/0½	1/9½	8d.
5 in.	2/6	2/0½	9½d.

RAIN WATER PIPES.

Per yd. in 6 fts.	Pipe.	Bends.	Branches. Stock angles.
2 in.	2/0½	1/4½	2/0
2½ in.	2/1½	1/6½	2/4½
3 in.	2/7½	1/11½	2/10½
3½ in.	3/1	2/3½	3/4½
4 in.	3/6½	2/9½	4/0½

NETT PRICES.
Tonnage allowance—4-ton lots, 5 per cent.
2-ton lots, 2½ per cent.

L.C.C. COATED SOIL PIPES.—London Prices, ex Stock.

Per yd. in 6 fts.	Pipe.	Bends.	Branches.
2 in.	3/4½	2/4½	2/10½
2½ in.	4/0½	2/7½	3/7½
3 in.	4/4½	2/10½	4/3½
3½ in.	4/5½	3/7½	5/0½
4 in.	4/10	4/0½	5/9½

L.C.C. COATED DRAIN PIPE.

	Pipe.	Bends.	Branches.
3 in. per yd. in 9 fts.	5/5	6/3	9/11
cwt. qr. lbs.			
4 in. 1 1 20.	7/11	7/1	12/6
5 in. 1 2 22.	9/7	12/9	19/3
6 in. 2 0 6	11/5	14/9	25/6

Gaskin, 75/- per cwt.

* The information given on this page has been specially compiled for THE BUILDER, and is copyright. The aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information. Prices are subject to 2½ per cent. cash discount.

PRICES CURRENT OF MATERIALS—(*contd*).

	Per ton basis in London. £ s. d.		£ s. d.
IRON.—Staffordshire Crown, Merchant quality	17 2 6	to	18 7 6
IRON.—Staffordshire Marked Bars	20 0 0	to	22 0 0
Mild Steel Bars	19-12 0	to	21 2 0
Mild Steel Hoops	21 6 0	to	21 16 0
	Ex Merchant's Stock, per ton (two-ton lots).		
Soft Steel Sheets, C.R. and C.A.—			
20 gauge	24 17 6	to	27 5 0
24 gauge	25 2 6	to	27 0 0
26 gauge	25 17 6	to	27 15 0
Galvanised Corrugated Sheets, 6 ft. to 9 ft.—			
20 gauge	27 1 3	to	28 6 3
24 gauge	27 11 3	to	28 16 3
26 gauge	28 16 3	to	30 11 3
Galvanised Flat Sheets, C.R. and C.A.—			
20 gauge	28 11 3	to	30 8 9
24 gauge	29 1 3	to	30 18 9
26 gauge	30 6 3	to	32 3 9
	Per ton. £ s. d.		£ s. d.
Cut Nails, 3 in. and up	26 0 0	to	27 10 0
	ALL NETT.		

METAL WINDOWS.—Standard sizes, suitable for complete houses, including all fittings, painting two coats, and delivery to job, average price about 1s. 4d. to 1s. 7d. per foot super.

COPPER.

Seamless copper tubes (basis)	per lb.	1/3
Strong sheet	,,	1/6
Thin sheet	,,	1/7
Copper nails	,,	1/6
,, wire	,,	1/6

PLUMBERS' BRASS WORK.

Delivered in London.
Stamped by Met. Water Board.

CRUTCH HEAD S.D. BIB COCKS FOR IRON. EAST CLEAN.

½ in.	¾ in.
34/-	53/- per doz.

CHROMIUM PLATED TOILET S.D. BIB COCKS FOR IRON. EAST CLEAN.

½ in.	¾ in.
50/-	68/- per doz.

S.D. STOP COCKS FOR IRON.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
37/6	53/-	87/-	202/-	288/-	460/- per doz.

S.D.S. COCKS WITH TWO UNIONS FOR LEAD.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
47/-	75/6	120/-	226/-	360/-	588/- per doz.

DOUBLE NUT BOILER SCREWS.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
8/10	9/9	15/9	27/3	44/-	63/6 per doz.

HEAVY CROYDON BALL VALVES. SCREW IRON.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.
45/-	73/-	120/-	204/-	260/- per doz.

CAPS AND SCREWS.

1½ in.	1¾ in.	2 in.	3 in.	3½ in.	4 in.
10/6	12/9	19/3	34/-	48/-	55/- per doz.

BRASS SLEEVES.

1½ in.	2 in.	3 in.	3½ in.	4 in.
9/9	12/6	22/6	33/-	42/- per doz.

DRAWN LEAD TRAPS WITH BRASS CLEANING SCREWS.

	1½ in.	1¾ in.	2 in.	3 in.
8 lb. Lead P. . .	29/-	38/-	54/-	93/- per doz.
8 lb. Lead S. . .	36/-	42/-	67/-	120/- ,,

SOLDER.—Plumbers, 1/5. Tinmen's, 1/8. Blow pipe, 1/10 per lb.

PAINTS, &c.

		£ s. d.
Raw Linseed Oil, in drums	per gallon	0 5 4
Boiled ,, ,, in drums	,,	0 5 7
Turpentine, in drums (10 gals.)	,,	0 5 3
Genuine Ground English White Lead, per ton (In not less than 5-cwt. casks).		61 0 0
Extra for 1-cwt. kegs over 5-cwt. casks is 2/9 cwt.		
GENUINE WHITE LEAD PAINT "Father Thames," "Nine Elms," "Park," "Supremus," "St. Paul's," "Morganawyte," "Polsoco," "J" Brand, and other best brands (in 14 lb. tins) not less than 5-cwt. lots per ton delivered		83 10 0
Red Lead, Dry (packages extra)	per ton	52 0 0
Best Linseed Oil Putty (1 ton lots)	per cwt.	0 17 1½
Size, XD quality	fkn.	0 3 6
Turpentine substitute can be obtained and prices vary according to the quality from 2/9 gallon upwards.		
		£ s. d.
SNOWCEM CEMENT PAINT	per cwt.	2 16 0
C.M.C. CAMOUFLAGE PAINT	per cwt.	2 16 0

VARNISHES, &c.

		Per gallon.
Oak Varnish	Outside	0 14 0
Fine do.	,,	0 16 0
Fine Copal	,,	0 18 0
Pale Copal	,,	1 0 0
Pale Opal Carriage	,,	1 4 0
Best do.	,,	1 12 0
Floor Varnish	Inside	0 18 0
Fine Pale Paper	,,	0 18 0
Fine Copal Cabinet	,,	1 2 0
Fine Copal Flatting	,,	1 0 0
Hard Drying Oak	,,	0 18 0
Fine Hard Drying Oak	,,	0 19 6
Fine Copal Varnish	,,	1 0 6
Pale do.	,,	1 12 0
Best do.	,,	1 2 6
Best Japan Gold Size		1 12 6
Best Black Japan		0 10 0
Oak and Mahogany Stain (water)		0 12 0
Brunswick Black		0 7 6
Berlin Black		0 14 0
Knotting (patent)		0 15 0
French and Brush Polish		0 12 0
Liquid Dryers in Terebene		0 9 0
Cairnes Black Enamel		0 7 0

GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

ORDINARY GLAZING QUALITY (O.Q.) AND SELECTED GLAZING QUALITY (S.Q.).

PER FOOT SUPER.

In sizes not exceeding 80 in. long or 48 in. wide or 110 united inches.

	O.Q.	S.Q.
18 oz. in 300 ft. cases	2½d.	2¾d.
24 oz. ,, 200 ft. ,,	3½d.	4d.
26 oz. ,, 200 ft. ,,	3¾d.	4¼d.
32 oz. ,, 200 ft. ,,	5¼d.	6¼d.
24 oz. ,, 300 ft. ,,	3¾d.	3¾d.
26 oz. ,, 300 ft. ,,	3¾d.	4¼d.
32 oz. ,, 300 ft. ,,	5¼d.	6¼d.
18 oz. Obscured Sheet		5¼d.
24 oz. Obscured Sheet		6¼d.
Fluted, 21 oz.		9d.
Enamelled, 18 oz.		5¼d.
,, 24 oz.		6¼d.

Extra price according to size and substance for squares cut from stock.

ENGLISH ROLLED PLATE AND FIGURED CATHEDRAL, ETC., IN CUT SIZES.

	Per ft.
Rolled plate, ¼ in.	5¼d.
Rough cast double rolled, ⅜ in.	6¼d.
Rough cast double rolled, ½ in.	6¼d.
Figured rolled, and Cathedral, white	6¼d.
Figured rolled and Cathedral, tinted	9¼d.
Rolled Sheet	6d.
Reeded, Broad Reeded, Cross Reeded and Chevron Reeded, ¼ in. thick	0 10½

Rolled plate is the same price as rough cast double rolled.

	Per ft. s. d.
Wire Rolled, ¼ in. thick	0 9½
Wired Cast, ¼ in. thick	0 9½
Georgian Wired Cast	0 10
"Calorex" Sheet, 21 oz.	2 6
,, ,, 32 oz.	4 0
,, Cast, ¼ in. thick	0 10
,, ,, ⅜ in. thick	1 0
,, ,, ½ in. thick	1 2
Non Actinic Glass, ¼ in. thick	0 9½
,, ,, ⅜ in. thick	1 0
,, ,, ½ in. thick	1 2

"VITA" GLASS.

	Per ft. s. d.
"Vita" Plate Glass, about ⅛" thick	
To 7 ft. super	5 0
Over 7 ft. super	7 6
"Vita" Sheet Glass, about 18/20 oz.	2 0
Cathedral "Vita" Glass:	
¼" thickness	2 0
⅜" ,,	3 0
½" Georgian Wired "Vita" Glass	3 6

LEAD, &c.

(Delivered in London.)	Per ton. £ s. d.
LEAD.—Sheet, English, 4 lb. and up	84 10 0
Pipe in coils	34 0 0
Soil pipe	39 10 0
Compo pipe	41 5 0

NOTE.—Country delivery, 20/- per ton extra, lots under 3 cwt. 4/- per cwt. extra and over 3 cwt. and under 5 cwt., 2/6 per cwt. extra. Cut to sizes, 4/- per cwt. extra.

Old lead, ex London area, at Mills ..... per ton £18 0 0.

BUILDING TRADE WAGES IN SCOTLAND

Following are grade rates authorised by the Scottish N.J.C. from February 1. Every endeavour is made to ensure accuracy, but we cannot be responsible for errors that may occur.

Grade Classification	A	A¹	A²	A³	B	B¹
Craftsmen	1/10½	1/10	1/9½	1/9	1/8½	1/8
Labourers	1/5	1/4½	1/4½	1/4	1/3½	1/3½

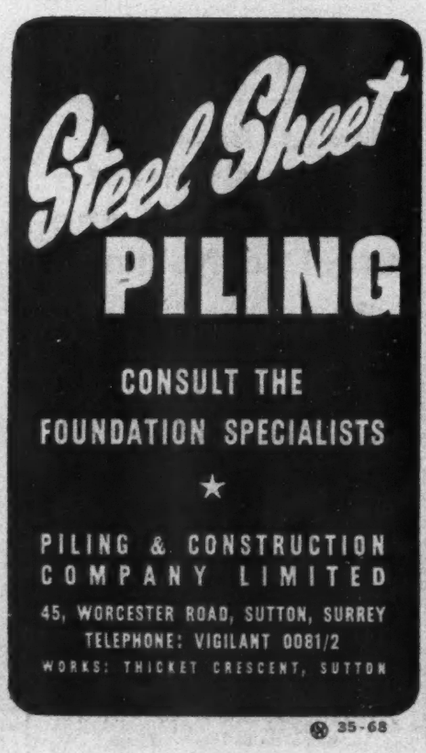
Aberdeen	A	Dumfriesshire	A³	Inverness	*	Perthshire	A³
Ayrshire	A	Dundee	A	Inverurie	A¹	Peterhead	A¹
Banff	A	Dunoon	A	Kincardineshire	A²	Renfrewshire	A
Berwickshire	A³	East Fife	A	Kinross-shire	A	Rothesay	A
Bridge of Allan	A	East Lothian	A	Lanarkshire	A	Roxburghshire	A⁴
Broughty Ferry	A	Edinburgh	A	Midlothian	A	St. Andrews	A
Clackmannanshire	A	Fifeshire	A	Monifieth	A	Selkirkshire	A³
Doune	A	Forfarshire	A³	Moray and Nairn	B	Stewartry	A³
Dunblane	A	Glasgow	A	Newport	A	Stirlingshire	A
Dumbartonshire	A	Greenock	A	Peebleshire	A³	Stornoway	A³
Dumfries	A¹	Hamilton	A	Perth	A	Tayport	A
						West Lothian	A

* This town has its own rates: Masons, 1/8½; Carpenters, 1/8½; Slaters, 1/8½; Plumbers, 1/9; Plasterers, 1/9½ but 1/10 is paid owing to the scarcity at present; Painters, 1/8½ and Labourers, 1/4.

The information given in this table is copyright. Rates of wages in England and Wales are given on page 188.

THE SCOTTISH BUILDER

AYR.—PREMISES.—Plans prepared by the London Metallic Capsule Co., Ltd., 392, Rotherhithe-st., London, for alterations and additions to garage, which will be reconstructed to new factory.



⊗ 35-68

EDINBURGH.—RESTAURANT. — Plans for communal restaurant centre prepared by Mr. E. J. MacRae, Municipal-bldgs.

GLASGOW. — PUMP-HOUSE. — Plans prepared for new pump-house for the Scottish Wholesale Co-operative Society, Ltd., Bunhouse-rd. The architect is Mr. C. Armour, 95, Morrison-st., Glasgow.

GLASGOW.—ADDITIONS.—Plans in hand for alterations and additions to police quarters, for T.C. Plans by Mr. Thomas Somers, architect, George-sq.

GLASGOW.—BUILDINGS.—Plans prepared by the Clyde Trust's own architects for new buildings, to be erected by Messrs. Bladen and Co., Ltd., Glasgow.

STONEHOUSE.—ADDITIONS. — Plans for alterations and additions at primary school prepared by Mr. W. Watts, architect, Albert-st., Motherwell-Wishaw.

NEW BUILDINGS IN LONDON

BARKING. — BUILDING. — The following plans have been considered by the T.C.: double storey building for Gross, Sherwood and Heald, Ltd.; office building for F. McNeill and Co., Ltd.; and factory buildings for William Warne and Co., Ltd.

BARKING.—PREMISES.—The T.C. are considering a proposal for the erection of a permanent building, at £2,800, to replace the existing shed, at a fire station.

DAGENHAM.—BUILDING.—The T.C. has approved the following plans: Grays Co-operative Society, messroom, etc.; Ford Motor Co., Ltd., stores buildings and A.R.P. shelter.

WOOLWICH.—BUILDING.—The L.C.C. has approved the following plans under the Town Planning Order: Standard Telephones and Cables, Ltd., North Woolwich, four factory extensions; W. F. Stanley and Co., Ltd., extension to spraying room; Marshall and Partners, 123, Sussex-gdns., Hyde Park, W.2, R.C. church, Plumstead; Thomas and Edge, Ltd., 25, Green's End, Woolwich, two storey warehouse and storeroom.

PURCHASE TAX

The following decision has been taken by the Secretaries' Office, Customs and Excise :—

Wholesale Value: Goods subject to quota restriction under Limitation of Supplies Orders.—Any charge made to a buyer of goods on account of the goods being the subject of quota restrictions under the above Orders is regarded as part of the purchase price and must be included in the computation of the tax value accordingly.

The following are supplementary decisions regarding the liability to tax of certain articles :—

CLASS 2.—FLOOR COVERINGS.—The Commissioners have reviewed the liability to tax of various floor coverings, and have decided that all interior floor coverings of any kind normally supplied in rolls, sheets, strips, squares, blocks, etc. (*e.g.*, rubber, cork, wood parquet and linoleum parquet), to be superimposed upon a sub-floor or primary base, such as concrete or wood boarding, are chargeable with tax, notwithstanding the fact that they may require to be cemented or otherwise permanently affixed. Tiles of pottery, stone or glass, metal floorings and composition material supplied in tins or casks to be moulded upon the site are not regarded as chargeable floor coverings.

The above ruling supersedes previous decisions in respect of certain tiles, squares and sheets of rubber, cork and linoleum.

CLASS 7 (LIGHTING FITTINGS AND DOMESTIC APPLIANCES, ETC.).—Not chargeable—exhaust fans designed for building into the structure of buildings.

The following decisions regarding the liability of stoves, grates and ranges modify those published in Notice No. 78 and in Press Notices dated October 22 and November 9, 1940 :—

CLASS 6.—DOMESTIC AND OFFICE FURNITURE.—Chargeable at the rate of 33⅓ per cent. : Movable curbs not built into the hearth; fire-guards.

CLASS 7.—DOMESTIC COOKING AND HEATING APPLIANCES.—Chargeable at the rate of 33⅓ per cent. : Adaptable fires and barless fires (including a complete fire basket and fret); ovens for domestic stoves, grates and ranges; boilers, *e.g.*, independent, back, side, ell, boot, etc., for domestic heating purposes; mantel registers and surrounds (whether of tiles, metal or other materials) sold as separate parts are not chargeable, but any domestic cooking or heating appliance sold complete with mantel register or slabbed tile surround, etc., is taxable on the wholesale value of the complete article supplied.

CLASS 9.—ARTICLES OF HARDWARE AND IRONMONGERY OF KINDS USED FOR DOMESTIC OR OFFICE PURPOSES.—Chargeable at the rate of 33⅓ per cent. : The following parts and accessories for domestic stoves, grates and ranges : Ashfronts, ashpans, ash preventers; bottoms, including false bottoms; coal savers; coal savers and trivets combined; drawplates; fire baskets and grate bottoms; firebacks and cheeks of firebrick or metal; frets, grate fronts and trivets; hearth plates of the portable type; hearth stands and plate stands.

TRADE NEWS

A New Cement.

A new cement has been introduced by the Cement Marketing Co., Ltd., to provide concrete which has to be in use at even earlier periods than is possible with concrete made with rapid-hardening Portland cement. Under good conditions concrete made with this "417 cement" can be put into effective use when about 16 hours old. Typical work calling for such high early strength includes concrete roads, aerodrome runways, gun emplacements and fortifications generally.

We understand that another important advantage attaching to this cement is afforded by its use for cold weather concreting. Concrete made with it is less liable to be damaged by frost, since it generates heat so rapidly during setting and hardening, which occurs soon after mixing, that (provided this heat can be retained within the concrete by means of the protection afforded by shuttering or adequate covering) the period during which the concrete is susceptible to frost action is very much reduced.

The manufacturers claim that "417 cement" permits the same rate of progress to be maintained in a temperature of 40 deg. F. as is possible with ordinary Portland cement at temperatures of 60 deg. to 65 deg. F. Since the cement, in addition to being rapid-hardening, is also quick setting, concrete with which it is made should be placed in position within 15 to 20 minutes of mixing. Full details and prices are obtainable from the company at the Club House, Coombe Hill, Kingston-on-Thames.

Asphalt in Underground Shelter Construction.

The use of asphalt in building construction is due to its adaptability and waterproof qualities over long periods, and to its ability to take up movement and stress without fracture. Its adoption, therefore, in air-raid shelters, where by reason of its nature and impervious character it can be used as a tanking, damp-course or easily cleaned hygienic floor, is to be recommended.

These notes, for which we are indebted to the Limmer and Trinidad Lake Asphalt Co., Ltd., are directed solely to the methods necessary to combat dampness and water pressure in existing shelters and in new construction underground; but they must be looked upon solely as a preliminary step to investigation, because not only are there many different types of shelters in existence, but the character of the subsoil, the location, access and areas to be treated, each presenting a different problem, should be taken into account. Consideration has been given to the adoption of the more economical forms of bituminous construction, such as gunned asphalt and the special flexible bituminous types of elasto-proof treatment; where the state of the internal walls in existing shelters precludes the use of asphalt, a non-asphaltic damp-proofing agent is recommended.

Reference to above-ground shelters has been purposely omitted, as the problem presented is one which is easily solved by the standard practices of mastic asphalt and other bituminous applications. On these and other waterproofing problems the Limmer and Trinidad Company will gladly give advice on application to 19, Grosvenor-place, London, S.W.1.

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'Phone: Walton-on-Thames 614 and 615.

TENDERS

The Editor welcomes authentic information for this feature from architects, surveyors or contractors. Items should reach 4, Catherine-street, Aldwych, W.C.2, not later than Wednesday morning.

Tenders for A.R.P. work will be found under "A.R.P. Schemes."

* *Denotes accepted.*
† *Denotes provisionally accepted.*
‡ *Denotes recommended for acceptance.*
‖ *Denotes accepted subject to modification.*
¶ *Denotes accepted by H.M. Government departments.*

Barnard Castle.—Relaying of water pipes to five extensions, for R.D.C. H. A. Smith, Sanitary Sur., 43, Galgate: *A. Brydon, Cockfield, Bishop Auckland, Co. Durham, £2,210 17s. 6d.

Barrow-in-Furness.—Resurfacing of yard at depot, for T.C. : *Nicholson & Wright, Ltd., £445 5s. 1d.

Birmingham. — Works, for E.C. : Repair and removal of hutment from council school to another council school, and for provision of additional shelters and alterations to first-aid post, *W. Lygo & Son, Coronation-rd., Bournbrook, Birmingham, £788 17s. 6d.; transfer of department of timber construction from council school to another council school and for provision of the necessary sanitary accommodation, *Percy W. Cox, Ltd., Grovela., Handsworth, Birmingham, £8,439; work at a council school, *E. G. Brown & Sons, Stuarts-rd., Stechford, Birmingham, £2,712 10s.; additional protection at council school, *Percy W. Cox, Ltd., £478; surface shelters at school clinic, *T. Lowe & Sons, Ltd., 10, St. Agatha's-rd., Birmingham, £298; strengthening foundations at R.C. school, *Morris Jacombs & Sons, Ltd., Stechford, Birmingham, £117.

Border.—5,434 lin. yds. of pipes for waterworks, for R.D.C. E. E. Harding, clerk, 7, Victoria-pl., Carlisle : *Turners Asbestos Cement Co., Trafford Park, Manchester, £983 9s. 3d.

Corby.—Laying of approximately 400 yd. 3-in. cast-iron water pipes, including the supply of necessary pipes and fittings, for U.D.C. D. W. Greaves, Eng. and Sur. : *A. Tailby & Son, Ltd., Desborough, £384 14s. 9d.

Gorton. — Additions to works, for Beyer, Peacock, Ltd. : *Works Dept., Gorton.

Greenock. — Alterations and additions to premises, for Corporation. T. Somers, architect, Municipal Offices : Joinery, etc., *J. McFadyen, Greenock; painting and allied works, etc., *A. Sinclair & Son, Greenock; heating and electric lighting, *Glasgow Electricity Labour Dept.

¶London (Air Ministry).—Contracts placed to the value of £500 or over for the week ended Feb. 1 :—

Building work : A. M. Carmichael, Ltd., Edinburgh; Wates, Ltd., London, and J. Gerrard & Sons, Ltd., Manchester.

Civil engineering work : Geo. Wimpey & Co., Ltd., Denham, Bucks, and Peter Lind & Co., Ltd., London.

Glazing : Pennycocks Patent Glazing and Eng. Co., Ltd., Glasgow.

General maintenance work, Limpus & Son, Ltd., Kingston-on-Thames.

Aerodrome surface work, Landing Grounds Corp. (Gt. B.), Ltd., Northampton.

¶London (War Office).—Contracts placed for week ended Feb. 1 :—

Building work, A. J. Dunning & Sons, Weyhill, Hants; N. Pratt & Son, Ltd., Clyst St. Mary, Exeter; R. J. Barwick, Market-st., Dover, and Norman Wright (Bldrs.), Ltd., Portland House, Portland-rd., S. Norwood, S.E.25.

Hutting : J. W. Walton, Meadow-rd., Kidsgrove, Staffs (two contracts), and W. & A. Davies, Ltd., Snatchwood-rd., Abersychan, Pontypool.

Constructional work : Percy G. Trentham, Ltd., 69, New Oxford-st., London, W.1.

Miscellaneous works: G. J. Furneaux, Barrack-rd., Christchurch (two contracts); Brazier & Son, Ltd., 57, Above Bar, Southampton; the Gleeson Development Co., Ltd., London-rd., North Cheam; Arbro, Ltd., Malpas-rd., S.E.4; G. Lewis & Sons (Dover), Ltd., Widred-rd., Dover; Percy Bilton, Ltd., 50, George V-av., Pinner, and F. Parkinson & Son, Elizabeth-st., Blackpool.

Manchester.—Works, for T.C.: Erection of bureau and forming recesses in wall at a 'bus station, *J. H. Billings & Co., Ltd., Manchester; mason, *Mather & Ellis, Manchester; carpenter and joiner, *L. Taylor, Manchester; plumber and glazier, *J. Jaffrey & Co., Ltd., Manchester; plasterer and painter, *W. T. Roberts & Son, Ltd., Manchester. Foundations, etc., for new turbo-generator at a power-station, *John Dickinson & Co. (Bolton), Ltd., Bolton; demolition work, *Demolition & Construction Co., Ltd., London; steelwork, *Joseph Parks & Son, Northwich. Re-roofing exhauster-house, *G. Wimpey & Co., Ltd., London.

Maryport.—Roads and sewers for houses, for North-East Housing Assn., Ltd., Metro-Vick House, Northumberland-rd., Newcastle-on-Tyne. L. J. Couves & Partners, architects, 2, Westfield-ter., Gosforth: *Border Engineering Contractors, Ltd., 134, Queen-st., Whitehaven.

Newcastle-under-Lyme. — Renovations and repairs to stonework at cemetery church and chapel, for T.C. A. Cotton, Boro' Sur.: *Szerelmey, Ltd., London, £887; Naybro Stone Co., Ltd., Stoke-on-Trent, £743.

Norton.—Construction of main to link Sherburn regional water scheme and Wintringham regional scheme, for R.D.C.: *Squires & Sons, Ltd., £1,158.

Sheffield.—Works, for T.C.: Construction of dock in river, *Mitchell Engineering Co., Ltd., Wincobank, Sheffield.

Tyldesley.—Alterations to branch, for Tyldesley & District Industrial Co-operative Society, Ltd., Elliott-st.: *R. & W. Gregson, Milk-st., Tyldesley, nr. Manchester.

York.—Works, at a hospital, for T.C.: Terrazzo, *O. Toffolo & Son, Ltd., Hull, £2,407 16s. 3d.; cork flooring, *Cork Insulation and Asbestos Co., Ltd., London, £2,522 5s. 7d.

Employers' New President.

Mr. Herbert C. Hayes, of Orchard House, Stoke Bishop, managing director of Messrs. C A. Hayes & Sons, building contractors, Bristol, has been installed in London into the office of President of the National Federation of Building Trades Employers. Mr. Hayes was President of the Bristol Federation of Building Trades Employers in 1922, and of the South-Western Federation of Building Trades Employers in 1930.

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CURRENT AND PROPOSED BUILDING WORK*

Accrington.—Housing Committee recommending further building.

Banstead. — U.D.C. approved £10,385 for road works during 1940-41.

Barking.—T.C. to provide mess accommodation at salvage depot, at £220.

Bath.—T.C. approved: alteration "York House" Hotel.

Blackburn.—Health Committee propose electric lift and X-ray unit in hospital, at £900.

Bowland.—R.D.C. propose mortuary at Bolton-by-Bowland.

Cockermouth.—222 houses, to be erected by R.D.C.

Coulsdon and Purley.—U.D.C. approved £12,778 for road schemes for 1941-42.

Cumberland.—C.C. to widen Whiteclosegate-Houghton-rd., at £11,000. Plans by County Sur., Carlisle.

Darlington.—T.C. to apply to Electricity Commissioners for sanction to borrow money for separate switch house at an electricity generating station.—Darlington Forge and Engineering Co., Ltd., to extend machine shop.

Gateshead.—Scheme for extensions to factory for Jayess Clothing Co., Ltd., to proceed and contract will be settled shortly. Architects, Newcombe and Newcombe, 23, Eldon-sq., Newcastle-on-Tyne.

Glossop.—J. Hadfield, Barratt and Co., Ltd., 17, Altrincham-st., Manchester, acquired premises for conversion to new works.

Gloucester.—T.C. approved: rebuilding of workshop for Wm. Gardner and Sons (Gloucester), Ltd.; rebuilding premises for H. Fairweather and Co.; additions and alterations to adapt premises for communal feeding centre for Ministry of Works and Buildings.

Hebburn.—Licence granted for hotel for W. McEwan, Newcastle. Cost, £8,000. Architects, T. A. Page, Son and Bradbury, 75, King-st., South Shields.

Hull.—T.C. approved plans: club premises, Endyke-la. estate for trustees of Y.W.C.A.

Keighley—E.C. to instal electricity in two council schools.

Kettering.—T.C. approved plans: garage, Upson's, Ltd.; warehouse, E. Mills and Son; alterations to paper warehouse, T. Beaty Hart, Ltd.

Leyland.—U.D.C. propose fire station, at £5,000. Plans by F. D. Howe, Sur.

Manchester.—T.C. approved proposals for alterations and adaptations at a convalescent home.—Council received sanction to borrow £3,000 for extension of sewage works.—Public Health Committee approved additional sanitary fittings at nurses' home, hospital, at £870, and electrical installation at sanatorium, at £750.—Plans passed: Offices, Blackley; A. N. Plant, building, Blackley; loading bay to factory, Ancoats; fire station to works, Blackley; welding shop to works, Moston.

Newcastle-under-Lyme. — T.C. proposes additional storey to fire station. Plans by A. Cotton, Boro' Sur.

Northwich.—U.D.C. to erect pump house and meter house at reservoir Plans by F. L. James, Sur. and Water Eng., Church-rd.

Rotherham.—T.C. approved: warehouse and two stores buildings, Howell and Co., Ltd., Sheffield; canteen to works, Steel, Peech and Tozer, Ltd.

Salford.—Health Committee to adapt two schools for emergency hospitals.

Sheffield.—T.C. approved: pump house and laying rising main from pump house, for Darwin's, Ltd., Tinsley.—T.C. to seek permission to erect additional houses.

Stanley.—Council received sanction from M.H. to proceed with 22 houses, at £14,512.

Stretford.—T.C. to invite tenders for demolition of chimney at a council depot.

Stoke-on-Trent. — T.C. approved: W. Bettelley, 2-12, Bridge-st., Fenton, alterations; R. H. and S. L. Plant, warehouse, Loughton.

Sunderland.—T. Ford, architect for conversion of building into business premises.

Wakefield.—T.C. approved: alterations for Lotus Shoe Co., Ltd.

Walsall.—Watch Committee propose bathrooms at police houses.

Woolwich.—Drainage plans approved by B.C.: Tuff and Hoar, Ltd., 16 and 17, Woolwich High-st., S.E.18, extension to office premises; Royal Arsenal Co-operative Society, Ltd., Commonwealth-bldgs., Woolwich Church-st., S.E.18, alterations and additions to shop premises.

* See also List of Contracts Open.

NEW COMPANIES

THE particulars quoted below have been compiled by Messrs. Jordan & Sons, Ltd., Company Registration Agents, of 116 and 117, Chancery-lane, W.C.2, from the documents available at the Companies Registry.

WATEL UNITS, LTD. (364375).—Registered December 16. Manufacturers of and dealers in constructional units of a waterproof character, etc. Nominal capital: £1,000. S. Bird, 11, Serjeant's Inn, E.C.4.

EDWIN HANNEY, LTD. (364356).—Registered December 16. 13, Grange-street, Port Talbot. Painters, decorators, etc. Nominal capital: £500. Marjorie Bradfield, Ty Gwyn, Penywern, Neath.

HARRISON AND CO. (BUILDERS' MERCHANTS), LTD. (364295).—Registered December 11. Builders' merchants. Railway Arch, Midland Goods Yard, Leytonstone. Nominal capital: £3,000.

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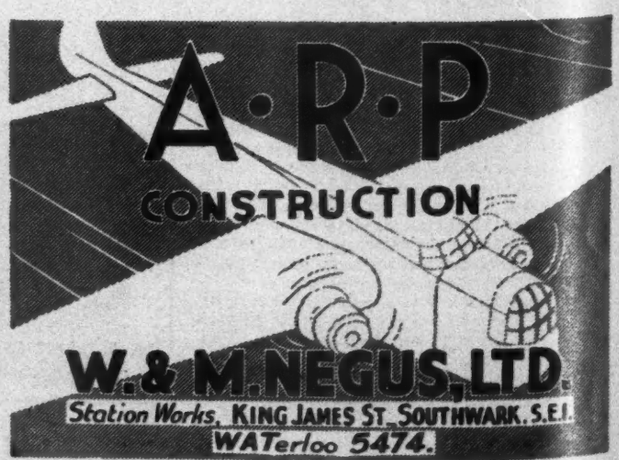
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